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**DRAFT ECONOMIC IMPACT ANALYSIS  
OF PROPOSED CRITICAL HABITAT  
FOR THE NEWCOMB'S SNAIL**

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## TABLE OF CONTENTS

|   | <u>Page</u>  |
|---|--------------|
| <b>FOREWORD.....</b>  | <b>F-1</b>   |
| <b>PREFACE.....</b>   | <b>P-1</b>   |
| <b>EXECUTIVE SUMMARY.....</b>                                   | <b>ES-1</b>  |
| <b>CHAPTER</b>  |              |
| <b>I. THE NEWCOMB'S SNAIL AND PROPOSED CRITICAL HABITAT....</b> | <b>I-1</b>   |
| <b>II. PHYSICAL AND SOCIOECONOMIC PROFILE OF KAUA'I.....</b>    | <b>II-1</b>  |
| <b>III. THE ENDANGERED SPECIES ACT.....</b>                     | <b>III-1</b> |
| <b>IV. EXISTING PROTECTIONS.....</b>                            | <b>IV-1</b>  |
| <b>V. APPROACH TO THE ECONOMIC IMPACT ANALYSIS.....</b>         | <b>V-1</b>   |
| <b>VI. ECONOMIC COSTS AND BENEFITS.....</b>                     | <b>VI-1</b>  |
| <b>REFERENCES.....</b>  | <b>R-1</b>   |

## FIGURES

| <b><u>Figure</u></b>   | <b><u>Page</u></b> |
|--|--------------------|
| ES-1 Newcomb's Snail Proposed Critical Habitat, Unit I–<br>Na Pali Coast Streams: Kalalau Stream, Hanakoa Stream,<br>and Hanakapi'ai Stream. . . . .                           | ES-4               |
| ES-2 Newcomb's Snail Proposed Critical Habitat, Unit II–<br>Northern Central Rivers: Wainiha River, Lumaha'i River,<br>and Hanalei River. . . . .                              | ES-5               |
| ES-3 Newcomb's Snail Proposed Critical Habitat, Unit III–<br>Eastside Mountain Streams: Waipahe'e Stream, Makaleha Stream<br>and Springs, and North Fork Wailua River. . . . . | ES-6               |
| II- 1 Island of Kaua'i. . . . .  | II-5               |

## TABLES

| <b><u>Table</u></b>   | <b><u>Page</u></b> |
|---|--------------------|
| ES- 1 Section 7 Costs and Benefits Attributable to the Newcomb's<br>Snail Listing and Critical Habitat. . . . . | ES- 7              |
| I- 1 Information on the Newcomb's Snail Proposed Critical Habitat. . . . .                                      | I- 6               |
| II- 1 Socioeconomic Profile of the County of Kaua'i . . . . .   | II- 6              |
| VI- 1 Estimated Cost of a Section 7 Consultation and Biological Survey. . . . .                                 | VI - 3             |
| VI- 2 Section 7 Costs and Benefits Attributable to the Newcomb's<br>Snail Listing and Critical Habitat. . . . . | VI- 21             |

## FOREWORD

The U.S. Fish and Wildlife Service has added the following to all economic analyses of critical habitat designations:

"The standard best practice in economic analysis is applying an approach that measures costs, benefits, and other impacts arising from a regulatory action against a baseline scenario of the world without the regulation. Guidelines on economic analysis, developed in accordance with the recommendations set forth in Executive Order 12866 ("Regulatory Planning and Review"), for both the Office of Management and Budget and the Department of the Interior, note the appropriateness of the approach:

*'The baseline is the state of the world that would exist without the proposed action. All costs and benefits that are included in the analysis should be incremental with respect to this baseline.'*

"When viewed in this way the economic impacts of critical habitat designation involve evaluating the 'without critical habitat' baseline versus the 'with critical habitat' scenario. Impacts of a designation equal the difference, or the increment, between these two scenarios. Measured differences between the baseline and the scenario in which critical habitat is designated may include (but are not limited to) changes in land use, environmental quality, property values, or time and effort expended on consultations and other activities by federal landowners, federal action agencies, and in some instances, State and local governments and/or private third parties. Incremental changes may be either positive (benefits) or negative (costs).

"In *New Mexico Cattle Growers Ass'n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001), however, the 10th Circuit recently held that the baseline approach to economic analysis of critical habitat designations that was used by the Service for the southwestern willow flycatcher designation was 'not in accord with the language or intent of the ESA.' In particular, the court was concerned that the Service had failed to analyze any economic impact that would result from the designation, because it took the position in the economic analysis that there was no economic impact from critical habitat that was incremental to, rather than merely co-extensive with, the economic impact of listing the species. The Service had therefore assigned all of the possible impacts of designation to the listing of the species, without acknowledging any uncertainty in this conclusion or considering such potential impacts as transaction costs, reinitiations, or indirect costs. The court rejected the baseline approach incorporated in that designation, concluding that, by obviating the need to

perform any analysis of economic impacts, such an approach rendered the economic analysis requirement meaningless: 'The statutory language is plain in requiring some kind of consideration of economic impact in the CHD phase.'

"In this analysis, the Service addresses the 10th Circuit's concern that we give meaning to the ESA's requirement of considering the economic impacts of designation by acknowledging the uncertainty of assigning certain post-designation economic impacts (particularly section 7 consultations) as having resulted from either the listing or the designation. The Service believes that for many species the designation of critical habitat has a relatively small economic impact, particularly in areas where consultations have been ongoing with respect to the species. This is because the majority of the consultations and associated project modifications, if any, already consider habitat impacts and as a result, the process is not likely to change due to the designation of critical habitat. Nevertheless, we recognize that the nationwide history of consultations on critical habitat is not broad, and, in any particular case, there may be considerable uncertainty whether an impact is due to the critical habitat designation or the listing alone. We also understand that the public wants to know more about the kinds of costs consultations impose and frequently believe that designation could require additional project modifications.

"Therefore, this analysis incorporates two baselines. One addresses the impacts of critical habitat designation that may be 'attributable co-extensively' to the listing of the species. Because of the potential uncertainty about the benefits and economic costs resulting from critical habitat designations, we believe it is reasonable to estimate the upper bounds of the cost of project modifications based on the benefits and economic costs of project modifications that would be required due to consultation under the jeopardy standard. It is important to note that the inclusion of impacts attributable co-extensively to the listing does not convert the economic analysis into a tool to be considered in the context of a listing decision. As the court reaffirmed in the southwestern willow flycatcher decision, 'the ESA clearly bars economic considerations from having a seat at the table when the listing determination is being made.'

"The other baseline, the lower boundary baseline, will be a more traditional rulemaking baseline. It will attempt to provide the Service's best analysis of which of the effects of future consultations actually result from the regulatory action under review - i.e. the critical habitat designation. These costs will in most cases be the costs of additional consultations, reinitiated consultations, and additional project modifications that would not have been required under the jeopardy standard alone as well as costs resulting from uncertainty and perceptual impacts on markets."

Dated: March 20, 2002

## PREFACE

### 1. CONTENT AND PURPOSE

This report assesses the economic impacts that may result from the designation of critical habitat for the threatened Newcomb's Snail (*Erinna newcombi*) (the Snail) on the island of Kaua'i in the State of Hawai'i. It was prepared for the U.S. Fish and Wildlife Service (the Service) to help them in their decision regarding designating critical habitat for the Snail.

As required by the Endangered Species Act, as amended (the Act), the decision to designate a particular area as critical habitat must take into account the potential economic impact of the critical habitat designation. If the economic analysis reveals that the economic impacts of designating any area as critical habitat outweigh the benefits of designation, then the Service may exclude the area from consideration, unless excluding the area will result in the extinction of the species.

The focus of the economic analysis is on section 7(a)(2) of the Act which requires consultation with the Service and possible project modification for certain projects and activities that may affect a species listed as threatened or endangered, or the habitat of a listed species. The consultations and possible project modifications will have economic impacts which, in this report, are referred to as "section 7 economic impacts" to distinguish them from the economic impacts related to other sections of the Act. Other sections of the Act are outside the scope of this economic analysis.

### 2. ORGANIZATION

This report is organized into six chapters:

— Chapter I: The Newcomb's Snail and Proposed Critical Habitat

This chapter provides relevant information on the Snail and the proposed critical habitat units.

— Chapter II: Physical and Socioeconomic Profile of Kaua'i

To provide the context for evaluating the economic impacts of the proposed critical habitat designation, this chapter presents a physical description of Kaua'i and socioeconomic profile of Kaua'i County.

— Chapter III: The Endangered Species Act

Relevant information from the Act is presented in Chapter III, including the role of critical habitat designation in protecting threatened and endangered species, requirements for consulting with the Service, and the definition of taking and other restrictions.

— Chapter IV: Existing Protections

This chapter presents information on existing regulations and land management policies that protect wildlife species or their habitats.

— Chapter V: Approach to the Economic Impact Analysis

This chapter gives the general approach used to estimate section 7 economic impacts of the species listing and the critical habitat designation.

— Chapter VI: Economic Costs and Benefits

This chapter discusses planned projects, activities and land uses in the proposed critical habitat units and estimates section 7 economic costs and benefits. This chapter also identifies the effects which can be attributable solely to the critical-habitat provisions of section 7.

After learning about the proposed critical habitat (Chapter I), readers who are already familiar with Kaua'i County (Chapter II), the Act (Chapter III), existing protections (Chapter IV), or the approach to conducting the economic analysis (Chapter V) may wish to skip these chapters, as appropriate, and proceed to the analysis of economic impacts (Chapter VI).

### 3. TERMINOLOGY

The following Service terminology is *italicized* throughout this document for the benefit of readers who are unfamiliar with it and want to be reminded that the Service has given specific meanings to these words and terms: *Federal involvement*, *Federal nexus*, *occupied*, *unoccupied*, *primary constituent elements*, *jeopardy*, *adverse modification*, and *take*. The terms are explained in the body of the report.

### 4. MAPPING ACCURACY

Acreage estimates presented in Table I-1 and used in the text are based on digitized maps and acreage calculations provided by the Service. The data files for these maps were generated by the Service, other Federal agencies, State and county agencies, and private contractors. For the most part, the digitized maps are reasonably accurate at a scale of 1:24,000. Nevertheless, they are not exact: the mapped locations of certain fea-

tures (borders, roads, structures, etc.) sometimes deviate from their actual locations; maps from different sources may differ as to the locations of certain features; mapped borders of adjacent parcels may not be in perfect alignment even if they come from the same source; etc. As a result of these mapping discrepancies, some acreage estimates may be incorrect (when a slight discrepancy extends over several miles, the estimate can amount to many acres); area components may not sum to the whole area; and small amounts of land may be included in a proposed critical habitat unit when the intention was to exclude this land (e.g., a small amount of urban or agricultural land may be included inadvertently).

## **5. ECONOMIC CONSULTANTS**

The analysis was performed by Decision Analysts Hawaii, Inc. (DAHI) and Research Solutions, LLC, both Hawai'i-based economic consulting firms. They are under contract to Industrial Economics, Inc. (IEc), an economic consulting firm in Cambridge, Massachusetts. In conducting the analysis, DAHI and Research Solutions worked with the Service at the local level, while IEc worked with the Service at the national level.

## EXECUTIVE SUMMARY

### 1. INTRODUCTION

The purpose of this report is to identify and analyze the potential economic impacts that would result from the proposed critical habitat designation for the Newcomb's Snail (the Snail). Section 4(b)(2) of the Endangered Species Act (the Act) requires the Service to designate critical habitat on the basis of the best scientific and commercial data available after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

The focus of this economic analysis is on section 7(a)(2) of the Act, which requires Federal agencies to insure that any action authorized, funded, or carried out by the Federal government is not likely to *jeopardize* the continued existence of any endangered or threatened species or result in the destruction or *adverse modification* of critical habitat. Federal agencies are required to consult with the Service whenever they propose a discretionary action that may affect a listed species or its designated critical habitat. Aside from the protection that is provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat. Because consultation under section 7 only applies to activities that involve Federal permits, funding or involvement, the designation of critical habitat will not afford any additional protections under the Act with respect to strictly private activities. This analysis does not address impacts associated with implementation of other sections of the Act.

### 2. PROPOSED CRITICAL HABITAT DESIGNATION

The Service has proposed that nine critical habitat units totalling 5,209 acres be designated for the Snail. These units are located in the mountainous upper regions of nine stream and river systems in the northern and eastern portions of the island of Kaua'i (Figure ES-1).

### 3. ECONOMIC IMPACTS

For the most part, implementation of the section 7 listing and critical habitat provisions of the Act on the areas proposed for Snail critical habitat would have minor economic impacts for the following reasons:

- No farming or grazing activities, and no residential, commercial, industrial, or golf-course projects are located in any of the units, and none are planned. This situation reflects the fact that (1) the land is largely unsuitable for development and for most other activities due to the rugged mountain terrain, lack of access, and remote location; and (2) existing land-use controls severely limit development and most other activities in the mountainous interior of Kaua'i.
- Some existing and continuing activities involve the operation and maintenance of existing human-made features and structures. These are not subject to the critical habitat provisions of section 7 because they do not contain the *primary constituent elements* for the Snail, and therefore would not be impacted by the designation.
- Some existing and planned projects, land uses, and activities that could affect the proposed critical habitat units have no *Federal involvement* that would require section 7 consultation with the Service, so they are not restricted by the requirements of the Act.
- For the few anticipated projects and activities that will have *Federal involvement*, most are conservation efforts that will not negatively impact the Snail or its habitat, so they will be subject to the minimal level of informal section 7 consultation.

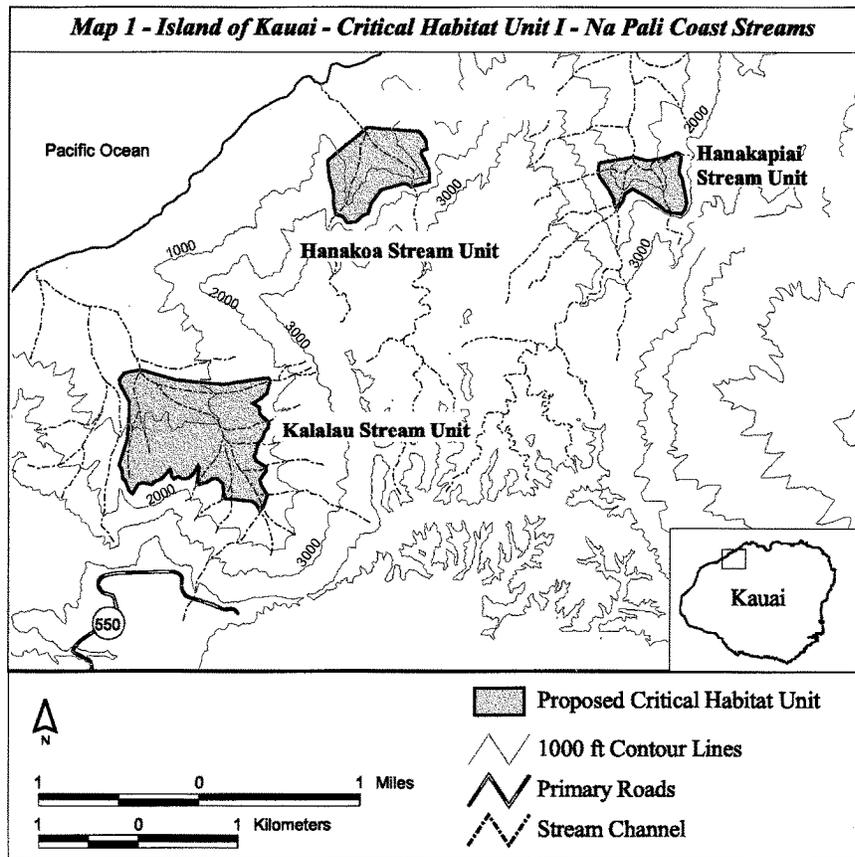
For various economic activities in the proposed Snail critical habitat, Table ES-1 presents estimates of (1) the total costs and benefits attributable to the section 7 provisions of the Act that are associated with listing the Snail as a threatened species *and* with designating critical habitat for the Snail, and (2) that portion of the total costs and benefits which is solely attributable to the critical habitat designation.

As shown in Table ES-1, the only section 7-related costs attributable to the Snail listing and the Snail critical habitat arise from (1) a few consultations on game-management, conservation, and natural-disaster recovery projects that are likely to receive Federal funding; and (2) potential costs to a private company to investigate the implications of having its land designated as Snail critical habitat. Over a 10-year time period, the total section 7-related costs associated with the Snail are estimated at \$33,700, while those attributable solely to the critical habitat designation are \$24,700.

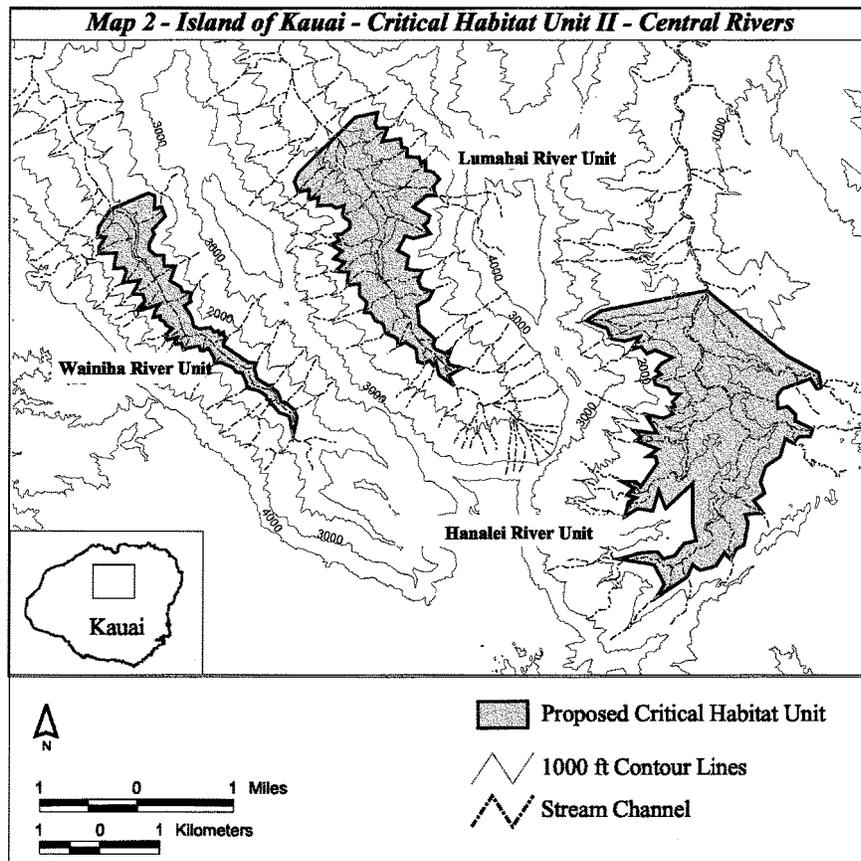
These costs represent a negligible percentage of the total personal income of Kaua'i County in 1999, which was \$1.3 billion.

Economic benefits resulting from the critical habitat designation could include the benefits of preserving the Snail. The value of these benefits is not estimated due to (1) the difficulty of quantifying the net changes in the benefits that would be attributable to the critical habitat designation and (2) the lack of existing economic studies on the economic value of these changes.

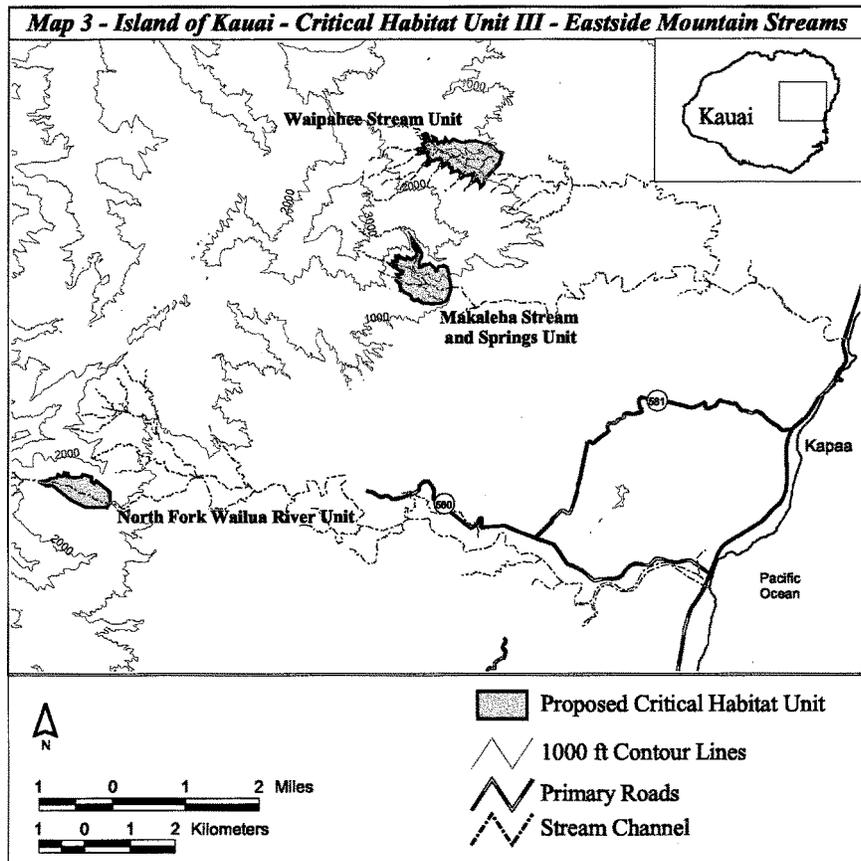
**Figure ES-1. Newcomb's Snail Proposed Critical Habitat, Unit I-  
Na Pali Coast Streams: Kalalau Stream, Hanakoa  
Stream and Hanakapi'ai Stream**



**Figure ES-2. Newcomb's Snail Proposed Critical Habitat, Unit II—  
Northern Central Rivers: Wainiha River,  
Lumaha'i River and Hanalei River**



**Figure ES-3. Newcomb's Snail Proposed Critical Habitat, Unit III—  
Eastside Mountain Streams: Waipahe'e Stream, Makaleha  
Stream and Springs, and North Fork Wailua River**



**Table ES-1. Section 7 Costs and Benefits Attributable  
to the Newcomb's Snail Listing and Critical Habitat  
(10-year estimates)**

CH = critical habitat      C&PM = consultation & project modification      Fed = Federal      ne = not estimated

| <b>Item</b>   | <b>Total</b>     | <b>Share to CH</b> | <b>Explanation</b>   |
|---|------------------|--------------------|--|
| <b>DIRECT COSTS (cost of C&amp;PM)</b>                          |                  |                    |  |
| <b>Management of Game Hunting</b>                               |                  |                    |  |
| State-managed land  | \$ 3,000         | \$ 3,000           | Consultation already required due to Fed funding and the presence of listed plants. Small additional effort to address impacts on the Snail CH.                              |
| Private lands   | None             | None               | No consultation required since no Fed involvement.   |
| <b>State Parks</b>  | None             | None               | No consultation required since no Fed involvement.   |
| <b>Conservation Projects</b>                                    |                  |                    |  |
| Partners for Fish & Wildlife (PFW) Projects                     | \$ 3,800         | \$ -               | If private landowner agrees to PFW projects, then the Service will conduct informal internal consultations on funded projects.   |
| The Nature Conservancy of Hawai'i and Waipa Foundation Projects | \$ 10,400        | \$ 5,200           | If agreements are reached for these organizations to manage land, and they receive funding from the Service, then the Service will conduct consultations on funded projects. |
| Watershed Partnership Projects                                  | \$ 1,500         | \$ 1,500           | If a watershed partnership is formed and it receives funding from the Service, then small additional effort to address impacts on the Snail CH.                              |
| <b>Water Systems</b>  |                  |                    |  |
| Operations & Maintenance (O&M)                                  | None             | None               | No consultation for O&M of existing human-made features and structures. Also, no Fed involvement.  |
| New Stream Diversions and Irrigation Ditches                    | None             | None               | No plans for new stream diversions or irrigation ditches that would impact CH.   |
| <b>Hydropower</b>   | None             | None               | No existing or planned facilities that would impact CH.  |
| <b>Ecotourism Operations</b>                                    | None             | None               | No consultation required since no Fed involvement.   |
| <b>Natural Disaster Recovery Projects</b>                       | \$ 1,500         | \$ 1,500           | Fed involvement, but small additional effort to address impacts on Snail CH.   |
| <b>INDIRECT COSTS</b>   |                  |                    |  |
| <b>Land Management</b>  | None             | None               | No obligation to proactively manage lands to control threats.  |
| <b>Loss in Property Values</b>                                  | Small            | Small              | Little or no loss in land values because little or no loss of potential economic use.  |
| <b>Investigate Implications of CH</b>                           | \$ 13,500        | \$ 13,500          | One private company may investigate the implications of CH on its land.  |
| <b>BENEFITS</b>   |                  |                    |  |
| <b>Increase in Ecotourism</b>                                   | Small            | Small              | Few additional visitors to Kaua'i to view small under-water snails in remote locations.  |
| <b>Benefits of Preserving the Snail</b>                         | ne               | ne                 | Difficult to estimate preservation benefits and their value.   |
| <b>TOTAL</b>  |                  |                    |  |
| <b>Costs</b>  | <b>\$ 33,700</b> | <b>\$ 24,700</b>   |  |
| <b>Benefits</b>   | <b>ne</b>        | <b>ne</b>          |  |

## THE NEWCOMB'S SNAIL AND PROPOSED CRITICAL HABITAT \*

## CHAPTER I

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Under the Endangered Species Act of 1973, as amended (the Act), the United States Department of the Interior, Fish and Wildlife Service (the Service) proposes to designate critical habitat for the threatened Newcomb's Snail (*Erinna newcombi*) (the Snail) on the island of Kaua'i in Hawaii. This chapter provides information on the Snail and the proposed critical habitat units, most of which comes from the document "Endangered and Threatened Wildlife and Plants; Proposed Determination of Critical Habitat for the Newcomb's Snail" (the proposed rule), published in the *Federal Register* on January 28, 2002. In addition, the Service provided valuable information for this chapter in the form of overlay resource maps and detailed acreage data.

### 1. THE NEWCOMB'S SNAIL

The Snail, a 1/4-inch-long, freshwater snail found only on the island of Kaua'i, was listed by the Service as a threatened species on January 26, 2000. The proposed rule contains detailed information on the appearance and biology of the Snail.

### 2. PROPOSED CRITICAL HABITAT UNITS

The Service is proposing nine units for designation as critical habitat for the Snail (Figures ES-1, ES-2 and ES- 3). Based on the proposed rule and other sources, this section and Table I-1 provide information on the units, including their *primary constituent elements*, general locations and terrain, excluded features and structures, the presence of the Snail, unit acreages, stream segment lengths, elevations, land ownership, existing land management, existing improvements and activities in the units, and anticipated

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\* **Note to Reader:** After reading this chapter, those who are already familiar with Kaua'i County (Chapter II), the Act (Chapter III), existing protections (Chapter IV), or the approach used in conducting the economic analysis (Chapter V), may wish to skip these chapters, as appropriate, and proceed to the economic analysis (Chapter VI).

developments and changes in land-use activities in the units. The proposed rule provides detailed information on the critical habitat boundaries and the map coordinates of boundary points.

### **2.a. Primary Constituent Elements**

Each of the proposed critical habitat units provides one or more of the *primary constituent elements* essential for the conservation of the species. The Service defines the *primary constituent elements* for the Snail as:

- Cool, clean, moderate- to fast-flowing water in streams, springs and seeps.
- Associated watersheds and hydrologic features that capture and direct water flow to these springs and streams.
- A hydrologic regime that supports perennial flow even in the most severe drought conditions.
- Stream channel morphology that provides protection from channel scour by overhanging waterfalls, protected tributaries, or similar places of shelter.

### **2.b. Location and Terrain**

The proposed critical habitat units contain portions of the upper reaches of streams and rivers in the mountainous regions of Kaua'i. Unit I—Na Pali Coast Streams (Kalalau Stream, Hanakoa Stream and Hanakapi'ai Stream) are small, short, and flow over steep terrain. Unit II—Northern Central Rivers (Wainiha River, Lumaha'i River and Hanalei River) are large compared to other rivers in the State, and flow through relatively low-gradient watersheds. Unit III—Eastside Mountain Streams (Waipaha'e Stream, Makaleha Stream and Springs, and North Fork Wailua River) flow towards the eastern and southeastern portions of the island and are intermediate in size.

The proposed critical habitat are not suitable for development due to their steep terrain, remote locations, and difficult access. Some of the units are accessible only by helicopter and are rarely visited.

### **2.c. Excluded Features and Structures**

Within the proposed critical habitat boundaries, only water bodies containing one or more of the *primary constituent elements* are proposed as critical habitat. Existing human-made features and structures (e.g., dams, ditches, tunnels, flumes, etc.) that do not contain the *primary constituent elements* are not proposed as critical habitat. In effect, these human-made features and structures are “unmapped holes” within the boundaries of a critical habitat unit, but the Service does not consider them to be part of the unit.

#### **2.d. Occupied and Unoccupied Streams**

The Service considers six of the nine streams to be *occupied* by the Snail. Three *unoccupied* streams were included in the proposed designation because the Service believes they are necessary to provide for the long-term survival and conservation of the species.

#### **2.e. Acreage, Stream Length and Elevation**

As shown in Table I-1, the nine proposed critical habitat units cover 5,209 acres, which is about 1.5 percent of the island. Stream length segments range from 0.35 mile to 4.71 miles, and total 16.35 miles. Unit elevations range from 400 feet to 1,600 feet.

#### **2.f. Land Ownership**

None of the area proposed as critical habitat is owned by the Federal government. Six of the units (3,168 acres, or 61 percent of the proposed designation) are owned entirely by the State. The remaining three units (2,041 acres, or 39 percent of the proposed designation) are owned almost entirely by private major landowners (the Service defines “major landowners” as owners of at least 500 acres in Hawai'i). None of the area is owned by small private landowners.

#### **2.g. Existing Land Management**

As shown in Table I-1, none of the proposed critical habitat units contains land that is controlled by the Federal government as part of a military facility, national park, national refuge, etc. Of significance to the Service, however, four of the units host 16 populations of listed non-invertebrate species.

All of the acreage proposed for critical habitat is subject to State control or management because it is in the State Conservation District—2,048 acres are in the Protective Subzone and the remaining 3,161 acres are in the Resource Subzone. In general, development and commercial activity is limited within the Conservation District. Chapter IV discusses in more detail the activities allowed in the Conservation District and its sub-zones.

In addition to the restrictions that are placed by the State on land uses in the Conservation District, most of the land in the proposed critical habitat units is directly managed by the State. Approximately 3,123 acres (60 percent of the proposed designation) are in State Forest Reserves which were established to protect native ecosystems and impor-

tant watersheds. Approximately 53 acres (1 percent) are in a Natural Area Reserve (NAR); NARs were established by the State to preserve and protect representative samples of Hawaii's biological ecosystems and geological formations. Approximately 556 acres (11 percent) are in a State park; the State Parks System was established to govern the use and protection of certain lands and historical and natural resources. And approximately 3,166 acres (61 percent) are in State Hunting Units; these are large areas managed by the State for public hunting. Chapter IV contains additional information on State Forest Reserves, NARs, State parks, and Hunting Units.

In summary, all of the critical habitat units except two (the Lumaha'i River and Waipahe'e Stream, totaling 1,476 acres) are currently managed by the State to promote the conservation of natural resources. In the future, the Wainiha River unit may come under the management of The Nature Conservancy of Hawai'i (TNCH) and the Lumaha'i River unit may come under the management of TNCH and the Waipa Foundation (see Chapter VI, Section 2).

None of the proposed critical habitat units contains land in the State's Urban, Rural, or Agricultural Districts. Land in these districts is subject to county land-use and development controls, including county community plans, zoning, and building code regulations affecting farm, residential, commercial, and industrial development and use.

## **2.h. Existing Improvements and Activities**

At the bottom of Table I-1, the section entitled "Improvements/Activities" identifies existing improvements and activities in each of the proposed critical habitat units. Most of this information was gathered from a variety of resource maps. These existing improvements and activities include:

- One 4-wheel-drive trail in the North Fork Wailua River unit.
- One hiking trail in each of the three Na Pali Coast streams units.
- Portions of the Ka'apoko Tunnel and Hanalei Tunnel in the Hanalei River unit. (These tunnels and water-diversion structures are abandoned and in disrepair, and no longer divert water out of the Hanalei watershed).
- Two gaging stations in the Wainiha River and the North Fork Wailua River units.
- A water-diversion structure and a portion of the Waiahi-IIiliula-North Wailua Ditch in the North Fork Wailua River unit.
- A water-diversion structure and a portion of the Kealia Ditch in the Waipahe'e Stream unit.

- Park recreation in the three Na Pali Coast streams units.
- Public hunting in the Hanalei River, Makaleha Stream and North Fork Wailua River units.
- Public bow-and-arrow hunting in the three Na Pali Coast streams units.

No residential, commercial, industrial, or golf-course projects are located in any of the units, and no farming or grazing takes place in the units. Also, existing human-made features and structures in the list above are not proposed as critical habitat (see Section 2.c above).

### **2.i. Anticipated Development and Changes in Activities**

The major change in the proposed units may involve a small number of conservation projects and more intensive conservation land-management.

No agricultural, residential, commercial, or industrial development or other significant development or change in land-use activities is anticipated in any of the proposed units. This outlook is based on known plans, development difficulties (i.e., rugged mountain terrain, difficult access, and remote locations), and applicable land-use controls that severely limit development in the mountainous interior of Kaua'i.

Most construction activity is likely to be limited to repairing trails and water diversions, tunnels and ditches. No known plans currently exist to build new facilities or structures in the proposed critical habitat units.

**Table I-1. Information on the Newcomb's Snail Proposed Critical Habitat**

| Item                                   | Units  | All Units |            |       |       |
|--|--------|-----------|------------|-------|-------|
|  |        | Occupied  | Unoccupied | Total | Share |
| <b>Critical Habitat Features</b>       |        |           |            |       |       |
| Newcomb's Snail in Stream              | yes/no | n/a       | n/a        | n/a   | n/a   |
| Total Area                             | acres  | 4,402     | 807        | 5,209 | n/a   |
| Stream Segment Length                  | miles  | 12.23     | 4.12       | 16.35 | n/a   |
| Elevation:                             |        |           |            |       |       |
| High                                   | feet   | n/a       | n/a        | n/a   | n/a   |
| Low                                    | feet   | n/a       | n/a        | n/a   | n/a   |
| <b>Land Ownership</b>                  |        |           |            |       |       |
| Federal                                | acres  | -         | -          | -     | 0%    |
| State                                  | acres  | 2,927     | 241        | 3,168 | 61%   |
| Private, Major Landowner               | acres  | 1,475     | 566        | 2,041 | 39%   |
| Private, Minor Landowner               | acres  | -         | -          | -     | 0%    |
| <b>Federally Controlled or Managed</b> |        |           |            |       |       |
| National Parks and Refuges             | acres  | -         | -          | -     | 0%    |
| FWS, Non-invertebrate Populations      | count  | 13        | 3          | 16    | -     |
| <b>State Controlled or Managed</b>     |        |           |            |       |       |
| Conservation District                  | acres  | 4,402     | 807        | 5,209 | 100%  |
| Protective Subzone                     | acres  | 1,461     | 586        | 2,048 | 39%   |
| Resource Subzone                       | acres  | 2,941     | 221        | 3,161 | 61%   |
| Forest Reserve                         | acres  | 2,557     | 566        | 3,123 | 60%   |
| Natural Area Reserves (NAR)            | acres  | -         | 53         | 53    | 1%    |
| State Parks                            | acres  | 368       | 187        | 556   | 11%   |
| Hunting Units                          | acres  | 2,925     | 241        | 3,166 | 61%   |
| <b>County Controlled or Managed</b>    |        |           |            |       |       |
| Urban and Rural District               | acres  | -         | -          | -     | 0%    |
| Agricultural District                  | acres  | -         | -          | -     | 0%    |
| <b>Improvements/Activities</b>         |        |           |            |       |       |
| No Improvements or Activities          | count  | 1         | -          | 1     | -     |
| 4-wheel-drive Trail                    | count  | 1         | -          | 1     | -     |
| Hiking Trail                           | count  | 1         | 2          | 3     | -     |
| Park Recreation                        | count  | 1         | 2          | 3     | -     |
| Hunting in State-managed Areas         | count  | 4         | 2          | 6     | -     |
| Water Improvements                     | count  | 5         | 1          | 6     | -     |

**Note:** Entries may not sum to totals due to rounding, slight acreage discrepancies, and overlapping land-management areas.

**Table I-1. Information on the Newcomb's Snail Proposed Critical Habitat**  
(continued)

| Item                                   | Units  | Unit I–Na Pali Coast Streams |                |                    |
|--|--------|------------------------------|----------------|--------------------|
|  |        | Kalalau Stream               | Hanakoa Stream | Hanakapi'ai Stream |
| <b>Critical Habitat Features</b>       |        |                              |                |                    |
| Newcomb's Snail in Stream              | yes/no | yes                          | no             | no                 |
| Total Area                             | acres  | 368                          | 155            | 86                 |
| Stream Segment Length                  | miles  | 0.86                         | 0.50           | 0.35               |
| Elevation:                             |        |                              |                |                    |
| High                                   | feet   | 1,600                        | 1,500          | 1,500              |
| Low                                    | feet   | 600                          | 400            | 600                |
| <b>Land Ownership</b>                  |        |                              |                |                    |
| Federal                                | acres  | -                            | -              | -                  |
| State                                  | acres  | 368                          | 155            | 86                 |
| Private, Major Landowner               | acres  | -                            | -              | -                  |
| Private, Minor Landowner               | acres  | -                            | -              | -                  |
| <b>Federally Controlled or Managed</b> |        |                              |                |                    |
| National Parks and Refuges             | acres  | -                            | -              | -                  |
| FWS, Non-invertebrate Populations      | count  | 11                           | 1              | 2                  |
| <b>State Controlled or Managed</b>     |        |                              |                |                    |
| Conservation District                  | acres  | 368                          | 155            | 86                 |
| Protective Subzone                     | acres  | 68                           | 43             | 28                 |
| Resource Subzone                       | acres  | 300                          | 112            | 57                 |
| Forest Reserve                         | acres  | -                            | -              | -                  |
| Natural Area Reserves (NAR)            | acres  | -                            | 44             | 9                  |
| State Parks                            | acres  | 368                          | 111            | 77                 |
| Hunting Units                          | acres  | 368                          | 155            | 86                 |
| <b>County Controlled or Managed</b>    |        |                              |                |                    |
| Urban and Rural District               | acres  | -                            | -              | -                  |
| Agricultural District                  | acres  | -                            | -              | -                  |
| <b>Improvements/Activities</b>         |        |                              |                |                    |
| No Improvements or Activities          | count  | -                            | -              | -                  |
| 4-wheel-drive Trail                    | count  | -                            | -              | -                  |
| Hiking Trail                           | count  | 1                            | 1              | 1                  |
| Park Recreation                        | count  | 1                            | 1              | 1                  |
| Hunting in State-managed Areas         | count  | 1                            | 1              | 1                  |
| Water Improvements                     | count  | -                            | -              | -                  |

**Note:** Entries may not sum to totals due to rounding, slight acreage discrepancies, and overlapping land-management areas.

**Table I-1. Information on the Newcomb's Snail Proposed Critical Habitat**  
(continued)

| Item                                   | Units  | Unit II–Northern Central Rivers |                |               |
|--|--------|---------------------------------|----------------|---------------|
|  |        | Wainiha River                   | Lumaha'i River | Hanalei River |
| <b>Critical Habitat Features</b>       |        |                                 |                |               |
| Newcomb's Snail in Stream              | yes/no | no                              | yes            | yes           |
| Total Area                             | acres  | 566                             | 1,215          | 2,164         |
| Stream Segment Length                  | miles  | 3.27                            | 3.11           | 4.71          |
| Elevation:                             |        |                                 |                |               |
| High                                   | feet   | 1,500                           | 1,500          | 1,500         |
| Low                                    | feet   | 800                             | 600            | 400           |
| <b>Land Ownership</b>                  |        |                                 |                |               |
| Federal                                | acres  | -                               | -              | -             |
| State                                  | acres  | -                               | -              | 2,164         |
| Private, Major Landowner               | acres  | 566                             | 1,215          | -             |
| Private, Minor Landowner               | acres  | -                               | -              | -             |
| <b>Federally Controlled or Managed</b> |        |                                 |                |               |
| National Parks and Refuges             | acres  | -                               | -              | -             |
| FWS, Non-invertebrate Populations      | count  | -                               | -              | -             |
| <b>State Controlled or Managed</b>     |        |                                 |                |               |
| Conservation District                  | acres  | 566                             | 1,215          | 2,164         |
| Protective Subzone                     | acres  | 515                             | 675            | 503           |
| Resource Subzone                       | acres  | 51                              | 541            | 1,661         |
| Forest Reserve                         | acres  | 566                             | -              | 2,164         |
| Natural Area Reserves (NAR)            | acres  | -                               | -              | -             |
| State Parks                            | acres  | -                               | -              | -             |
| Hunting Units                          | acres  | -                               | -              | 2,164         |
| <b>County Controlled or Managed</b>    |        |                                 |                |               |
| Urban and Rural District               | acres  | -                               | -              | -             |
| Agricultural District                  | acres  | -                               | -              | -             |
| <b>Improvements/Activities</b>         |        |                                 |                |               |
| No Improvements or Activities          | count  | -                               | 1              | -             |
| 4-wheel-drive Trail                    | count  | -                               | -              | -             |
| Hiking Trail                           | count  | -                               | -              | -             |
| Park Recreation                        | count  | -                               | -              | -             |
| Hunting in State-managed Areas         | count  | -                               | -              | 1             |
| Water Improvements                     | count  | 1                               | -              | 2             |

**Note:** Entries may not sum to totals due to rounding, slight acreage discrepancies, and overlapping land-management areas.

**Table I-1. Information on the Newcomb's Snail Proposed Critical Habitat**  
(continued)

| Item                                   | Units  | Unit III–Eastside Mountain Streams |                 |                         |
|--|--------|------------------------------------|-----------------|-------------------------|
|  |        | Waipahē'e Stream                   | Makaleha Stream | North Fork Wailua River |
| <b>Critical Habitat Features</b>       |        |                                    |                 |                         |
| Newcomb's Snail in Stream              | yes/no | yes                                | yes             | yes                     |
| Total Area                             | acres  | 261                                | 234             | 159                     |
| Stream Segment Length                  | miles  | 1.50                               | 0.99            | 1.06                    |
| Elevation:                             |        |                                    |                 |                         |
| High                                   | feet   | 1,200                              | 1,500           | 1,400                   |
| Low                                    | feet   | 800                                | 600             | 1,000                   |
| <b>Land Ownership</b>                  |        |                                    |                 |                         |
| Federal                                | acres  | -                                  | -               | -                       |
| State                                  | acres  | 2                                  | 234             | 159                     |
| Private, Major Landowner               | acres  | 259                                | -               | -                       |
| Private, Minor Landowner               | acres  | -                                  | -               | -                       |
| <b>Federally Controlled or Managed</b> |        |                                    |                 |                         |
| National Parks and Refuges             | acres  | -                                  | -               | -                       |
| FWS, Non-invertebrate Populations      | count  | -                                  | 2               | -                       |
| <b>State Controlled or Managed</b>     |        |                                    |                 |                         |
| Conservation District                  | acres  | 261                                | 234             | 159                     |
| Protective Subzone                     | acres  | 2                                  | 99              | 114                     |
| Resource Subzone                       | acres  | 259                                | 135             | 44                      |
| Forest Reserve                         | acres  | -                                  | 234             | 159                     |
| Natural Area Reserves (NAR)            | acres  | -                                  | -               | -                       |
| State Parks                            | acres  | -                                  | -               | -                       |
| Hunting Units                          | acres  | -                                  | 234             | 159                     |
| <b>County Controlled or Managed</b>    |        |                                    |                 |                         |
| Urban and Rural District               | acres  | -                                  | -               | -                       |
| Agricultural District                  | acres  | -                                  | -               | -                       |
| <b>Improvements/Activities</b>         |        |                                    |                 |                         |
| No Improvements or Activities          | count  | -                                  | -               | -                       |
| 4-wheel-drive Trail                    | count  | -                                  | -               | 1                       |
| Hiking Trail                           | count  | -                                  | -               | -                       |
| Park Recreation                        | count  | -                                  | -               | -                       |
| Hunting in State-managed Areas         | count  | -                                  | 1               | 1                       |
| Water Improvements                     | count  | 1                                  | -               | 2                       |

**Note:** Entries may not sum to totals due to rounding, slight acreage discrepancies, and overlapping land-management areas.

## PHYSICAL AND SOCIOECONOMIC PROFILE OF KAUA'I \*

## CHAPTER II

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To provide the context for evaluating the economic impacts of the proposed critical habitat designation, this chapter presents (1) a physical description of the island of Kaua'i, and (2) a socioeconomic profile of the County of Kaua'i, which includes Kaua'i and the small nearby island of Ni'ihau.

### 1. PHYSICAL DESCRIPTION OF KAUA'I

Kaua'i is the northernmost and oldest of the eight major Hawaiian Islands. Formed by a single shield volcano, this highly eroded 553-square-mile island has a mountainous interior, deep canyons and valleys that extend from the interior of the island to the coast, and steep ridges and cliffs (see Figure II-1). Rain falls throughout the upper elevations, especially at Mount Wai'ale'ale—Kaua'i's second highest point at 5,148 feet, and one of the wettest spots on earth, where annual rainfall averages 450 inches. The summit plateau constitutes the remains of a huge caldera that is now partially covered by Alakai Swamp, at about 4,000 to 4,600 feet. Two of Kaua'i's many remarkable topographic features are Waimea Canyon and the Na Pali Coast. Waimea Canyon, which cuts deep into the interior of the island, is 14-1/2 miles long and 2,750 feet deep. The Na Pali Coast was formed by streams that cut deep valleys into the northwestern coastline, while wave action eroded the shoreline to form precipitous 3,000-foot cliffs.

Because of the age of the island and its relative isolation, levels of floristic diversity and endemism are higher on Kaua'i than on any other island in the Hawaiian archipelago. However, the native vegetation has undergone extreme alterations because of (1) past and present land use (e.g., agriculture) and (2) the intentional and inadvertent introduction of non-native plants and animals. Browsing, digging and trampling by ungulates (i.e., pigs, goats, cattle, sheep and deer) have resulted in increased numbers of

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\* **Note to Reader:** Readers who are already familiar with Kaua'i County may wish to skip this chapter and proceed to the next background-information chapters (Chapters III through V), or to the economic analysis (Chapter VI).

non-native plants because most of the non-native plants can colonize newly disturbed areas more quickly and effectively than can Hawai'i's native plants. As a result, native forests are now limited to Kaua'i's upper-elevation, moist and wet regions.

## **2. SOCIOECONOMIC PROFILE OF KAUA'I COUNTY**

Table II-1 summarizes socioeconomic information on Kaua'i County (i.e., Kaua'i and Ni'ihau). The data reflect almost entirely the population and economy of the island of Kauai because the privately owned island of Ni'ihau contains only 0.3 percent of the County's population and thus supports a very small fraction of the County's economic activity.

### **2.a. Population and Distribution**

In the year 2000, the County of Kaua'i had a population of about 58,500 residents, up 14.2 percent since the 1990 U.S. census. The total county population amounted to 4.8 percent of the State population, the smallest of the four counties. Only 160 of these county residents, mostly Native Hawaiians, lived on Ni'ihau.

Most residents on Kaua'i live in towns around the perimeter of the island, primarily along the east and south sides of Kaua'i, with smaller populations living in towns on the north shore. There are no towns on the northwest side of the island or in the mountainous interior.

### **2.b. Primary Economic Activities**

The principal economic driving forces for the economy of Kaua'i County are tourism, agriculture, and defense expenditures.

#### **2.b.(1) Tourism**

Kaua'i County hosted nearly 1.1 million visitors in 2000, resulting in an average of 18,041 visitors present on the island (the average visitor census). Of the visitors present, approximately 90 percent were Americans and most of the remainder were Japanese. Visitor expenditures on Kaua'i totaled approximately \$1.2 million in 2000, making it the dominant industry for the County.

Tourism counts declined during the 1990s, due largely to Hurricane Iniki in November 1992 which damaged many hotels. The annual number of visitors and the average visitor census were down 16.4 percent and 0.9 percent, respectively, since 1990. The smaller decline in the visitor census was due to an increase in the average length of

stay on the island. Even though the visitor counts declined, visitor expenditures increased 26.9 percent during the 1990s due to an increase in average daily expenditures per visitor. However, this increase was only slightly greater than the 25.5-percent increase in inflation as measured by the Consumer Price Index.

Until the terrorist attack of September 11, 2001, Kaua'i County's visitor industry was on the rebound. Contributing factors included (1) the robust economic growth in California and other western States, and (2) a new generation of commercial aircraft that can depart from the short runway on Kaua'i with sufficient fuel to fly to the U.S. mainland.

### **2.b.(2) Defense**

Located in the southwest corner of Kaua'i, the Pacific Missile Range Facility (PMRF) is the world's largest instrumented multi-environment range to support surface, subsurface, air and space operations. Operations vary from small, single-unit exercises to large, multiple-unit battle-group scenarios. Further facility development and operations are expected to evolve at PMRF in response to technological advances and defense initiatives.

PMRF is a major contributor to the economy of Kaua'i County, particularly on the west side of the island. In FY 2001, expenditures for PMRF and other defense initiatives on Kaua'i totaled about \$144 million. While substantial, defense expenditures represent just 12 percent of visitor expenditures.

### **2.b.(3) Agriculture**

For over a century, sugarcane was the economic mainstay on Kaua'i. However, the industry has suffered major contractions since the late 1960s. Four of five plantations have closed and about 46,100 acres of land have been released from sugarcane cultivation. Some of the fields have been planted in diversified crops, including coffee, papaya and other fruits, seed corn, flowers and nursery products, and vegetables and melons. Also, some fields have been converted to aquaculture, and some have been used for residential and other urban development. However, most of the former sugarcane land is now used for grazing cattle, which is a comparatively low-value use of the land.

Due to the contraction in the sugar industry, revenues from crops, livestock and aquaculture sales declined from \$64.4 million in 1990 to \$48.5 million in 2000. As a result, agriculture is now the smallest of the three major industries in Kaua'i County, with sales representing only 4 percent of visitor expenditures and 34 percent of defense expenditures.

### **2.c. Labor Force and Employment**

In 2000, Kaua'i County's civilian labor force numbered 29,400 people, up 14.2 percent since 1990. But employment, which numbered 27,500 people in 2000, was up only 11.3 percent. The contraction in the sugar industry and related industries, coupled with flat inflation-adjusted growth in tourism and insufficient growth in other industries, contributed to an unemployment rate of 6.5 percent in 2000 compared to the 1990 rate of 4.1 percent.

While employment increased during the 1990s, the number of wage and salary jobs increased by a smaller percentage (11.3 percent versus 3.5 percent). At the same time, the number of self-employed workers and self-employed farmers increased. Most of the wage and salary jobs (excluding self-employed workers and farmers) were concentrated in: construction; transportation, communications, and utilities; trade (retail and wholesale); services (hotel, tourism, and health); government; and agriculture. The number of wage and salary jobs declined in all categories except trade, services and government. The declines are less dramatic if self-employed workers are counted, particularly self-employed farmers.

### **2.d. Personal Income**

In 1999, total personal income and per-capita income for the County were \$1.3 billion and \$23,061, respectively—figures that were up 35.1 percent and 23.4 percent from 1990 levels. However, per-capita income failed to keep pace with inflation, which increased 25.5 percent over this same period. As suggested by the expenditure data discussed above, tourism makes the largest contribution to personal income.

### **2.e. Outlook for Growth and Socioeconomic Change**

Over the next 10 years, most of the population and urban growth on Kaua'i will be in Kukui'ula and Poipu along the south shore; Lihu'e, Wailua, and Kapa'a on the windward side; the Princeville area on the north shore; other existing urban centers; and some agricultural subdivisions. Little or no growth is anticipated in the mountainous interior of the island.

The primary growing sectors of the economy continue to be tourism, military activities centered at PMRF and, to a lesser extent, diversified agriculture. However, given the uncertain outlook for the dominant tourism industry combined with development controls that limit new resort development, slow to moderate economic growth is anticipated over the next 10 years for Kaua'i County.



**Table II-1. Socioeconomic Profile of the County of Kaua'i**

| <b>Item</b>   | <b>1990</b> | <b>1999</b> | <b>2000</b> | <b>Change<br/>Since 1990</b> |
|---|-------------|-------------|-------------|------------------------------|
| <b>Resident Population</b>                                    | 51,177      | -           | 58,463      | 14.2%                        |
| Kaua'i Island   | 50,947      | -           | 58,303      | 14.4%                        |
| Ni'ihau Island  | 230         | -           | 160         | -30.4%                       |
| <b>Visitors</b>   |             |             |             |                              |
| Annual Visitors   | 1,286,360   | -           | 1,074,821   | -16.4%                       |
| Average Visitor Census  | 18,200      | -           | 18,041      | -0.9%                        |
| U.S. Visitors   | 17,200      | -           | 16,254      | -5.5%                        |
| Foreign Visitors  | 1,000       | -           | 1,787       | 78.7%                        |
| <b>Income from Major Industries<br/>(\$ million)</b>          |             |             |             |                              |
| Visitor Expenditures  | \$ 945.8    | -           | \$ 1,200.0  | 26.9%                        |
| Defense Expenditures  | n/a         | -           | \$ 144.0    | n/a                          |
| Agricultural Sales  | \$ 64.4     | -           | \$ 48.5     | -24.7%                       |
| <b>Labor</b>  |             |             |             |                              |
| Civilian Labor Force  | 25,750      | -           | 29,400      | 14.2%                        |
| Employed  | 24,700      | -           | 27,500      | 11.3%                        |
| Unemployment Rate   | 4.1%        | -           | 6.5%        |                              |
| <b>Jobs, Wage and Salary Only<sup>1</sup></b>                 | 25,450      | -           | 26,350      | 3.5%                         |
| Construction, mining  | 1,450       | -           | 1,000       | -31.0%                       |
| Manufacturing   | 900         | -           | 500         | -44.4%                       |
| Transp, communications, utilities                             | 2,400       | -           | 1,750       | -27.1%                       |
| Trade   | 7,050       | -           | 7,450       | 5.7%                         |
| Finance, insurance, real estate                               | 1,550       | -           | 1,100       | -29.0%                       |
| Services and miscellaneous                                    | 7,600       | -           | 9,500       | 25.0%                        |
| Government  | 3,350       | -           | 4,100       | 22.4%                        |
| Agriculture   | 1,150       | -           | 950         | -17.4%                       |
| <b>Personal Income</b>  |             |             |             |                              |
| Total (\$ million)  | \$ 965      | \$ 1,304    | -           | 35.1%                        |
| Per capita  | \$ 18,692   | \$ 23,061   | -           | 23.4%                        |
| <b>Consumer Price Index—All<br/>Urban Consumers, Honolulu</b> | 138.10      | 173.30      | -           | 25.5%                        |

**Notes:** 1. Year 2000 job counts are preliminary.

**Source:** Department of Business, Economic Development & Tourism. *The State Data Book*. Annual.

## THE ENDANGERED SPECIES ACT \*

## CHAPTER III

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This chapter provides relevant information from the 1973 Endangered Species Act (the Act), including the role of critical habitat designation in protecting threatened and endangered species, requirements for consulting with the Service to insure that certain Federal actions do not endanger listed species or their habitats, and prohibited activities that apply to listed species.

### 1. ROLE OF SPECIES LISTING AND CRITICAL HABITAT DESIGNATION IN PROTECTING THREATENED AND ENDANGERED SPECIES

For species listed as threatened and endangered, the Act requires the Service to designate critical habitat to the maximum extent prudent and determinable. The Act defines critical habitat as the specific areas containing features essential to the conservation of a threatened or endangered species and that may require special management considerations or protection.

For listed species, section 7(a)(2) of the Act requires Federal agencies to consult with the Service in order to ensure that activities they fund, authorize, permit, or carry out are not likely to *jeopardize* the continued existence of the species. The Act defines *jeopardy* as any action that would appreciably reduce the likelihood of both the survival and recovery of the species.

For the critical habitat of listed species, section 7(a)(2) further requires Federal agencies to consult with the Service to ensure that activities they fund, authorize, permit, or carry out do not result in destruction or *adverse modification* of critical habitat.

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\* **Note to Reader:** Readers who are already familiar with the Act may wish to skip this chapter and proceed to the next background-information chapters (Chapters IV and V), or to the economic analysis (Chapter VI).

*Adverse modification* of critical habitat is defined as any direct or indirect alteration that appreciably diminishes the value of critical habitat for the survival and recovery of the species.

As stated in the proposed rule, "... critical habitat also provides non-regulatory benefits to the species by informing the public [as well as land-managing agencies] of areas that are important for species recovery and where conservation actions would be most effective." "Critical habitat also identifies areas that may require special management considerations ... and may help provide protection to areas where significant threats to the species have been identified or help to avoid accidental damage to such areas."

## **2. CONSULTATION UNDER SECTION 7 OF THE ACT**

As indicated above, section 7 of the Act requires Federal agencies to consult with the Service whenever activities they fund, authorize, or carry out may affect listed species or designated critical habitat. Section 7 consultation with the Service is designed to ensure that current or future Federal actions do not appreciably diminish the value of critical habitat for the survival and recovery of a listed species.

The Service has authority under section 7 to consult on activities on land owned by individuals, organizations, states, or local and tribal governments only if the activities on the land have a *Federal nexus*. A *Federal nexus* occurs when the activities require a Federal permit, license, or other authorization, or involve Federal funding. The Service does not have jurisdiction under section 7 to consult on activities occurring on non-Federal lands when the activities are not Federally funded, authorized, or carried out. In addition, consultation is not required for activities that do not affect listed species or their critical habitat.

When consultations concern activities on Federal lands, the relevant Federal Action agency initiates consultation with the Service. When an activity proposed by a state or local government or private entity requires a Federal permit or is Federally funded or carried out, the Federal agency with the *nexus* to the activity initiates consultation with the Service. For example, the Army Corps of Engineers is the agency that issues section 404 permits under the Clean Water Act, so it is the Action agency.

The consultation begins after the Federal Action agency determines that its action may affect one or more listed species or their designated critical habitat, even if the effects are expected to be beneficial since projects with overall beneficial effects could include some adverse impacts. Consultations are frequently conducted for multiple species if more than one species is affected by the action.

The consultation between the Federal Action agency and the Service may involve informal consultation, formal consultation in the case of adverse impacts, or both. Informal consultation may be initiated via a telephone call or letter from the Action

agency, or a meeting between the Action agency and the Service. In preparing for an informal consultation, the Action agency compiles all the biological, technical, and legal information necessary to analyze the scope of the activity and discusses strategies to eliminate adverse effects on listed species or critical habitat. Through informal discussions, the Service assists the Action agency and the Applicant, if any, in identifying and resolving potential conflicts at an early stage in the planning process, and may make recommendations, if appropriate, on ways to avoid adverse effects.

If during informal consultation the Federal Action agency determines that its action (as originally proposed or revised and taking into account direct and indirect effects) “is not likely to adversely affect” listed species or critical habitat (e.g., the effects are beneficial, insignificant or discountable), and the Service agrees with that determination, then the Service provides concurrence in writing and no further consultation is required.

But if the proposed action, as revised during informal consultation, is still likely to adversely affect listed species or critical habitat, the Action agency must request in writing initiation of formal consultation with the Service and submit a complete initiation package. Formal consultations, which are subject to specific timeframes, are conducted to determine whether a proposed action is likely to *jeopardize* the continued existence of a listed species or destroy or *adversely modify* designated critical habitat. This determination depends on the extent to which a project may affect the species. Many variables, including the project’s size, location and duration, may influence the extent of the impact and, in turn, the determination of a “may effect” opinion.

If the Service finds, in its biological opinion, that a proposed action is not likely to *jeopardize* the continued existence of a listed species, or destroy or *adversely modify* the critical habitat—even though the action may adversely affect listed species or critical habitat—then the action likely can be carried out without violating section 7(a)(2) of the Act.

On the other hand, if the Service finds that a proposed action is likely to *jeopardize* the continued existence of a listed species and/or destroy or *adversely modify* the critical habitat, then the Service provides the Action agency with reasonable and prudent alternatives that will keep the action below the thresholds of *jeopardy* and/or *adverse modification*, if any can be identified.

The Service works with Action agencies and Applicants in developing reasonable and prudent alternatives. A reasonable and prudent alternative is one that (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the Action agency’s legal authority and jurisdiction; and (3) is economically and technologically feasible. The Service will, in most cases, defer to the Action agency’s expertise and judgment as to the feasibility of an alternative. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of a project. Costs associated with implementing reasonable and prudent alternatives vary accordingly.

### 3. TAKING AND OTHER RESTRICTIONS OF THE ACT

#### **3.a. Wildlife Species**

Regardless of any *Federal involvement* and critical habitat designation, once a species has been formally listed as threatened or endangered, it is entitled to certain regulatory protections under the Act. First and foremost, section 9 of the Act specifically prohibits the *taking* of any endangered species of fish or wildlife (the prohibition does not extend to plants). The term *take* is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." The regulations at 50 CFR section 17.3 define "harm" to mean an act that actually kills or injures wildlife. This may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. In addition, endangered species, their parts or any products made from them may not be imported, exported, possessed or sold. Section 4(d) of the Act gives the Service regulatory discretion to extend the protections of section 9 to threatened species.

However, the Act allows the Service to permit *take* by private applicants that would otherwise be prohibited, provided such *taking* is "incidental to, and not [for] the purpose of, the carrying out of an otherwise lawful activity." Section 10(a)(1)(B) of the Act allows non-Federal parties planning activities that have no *Federal nexus*, but which could result in the incidental *taking* of listed animals, to apply for an incidental *take* permit. The application must include a habitat conservation plan laying out the proposed actions, determining the effects of those actions on affected fish and wildlife species and their habitats (often including proposed or candidate species), and defining measures to minimize and mitigate adverse effects. The Service may elect to issue an incidental *take* permit if the incidental *take* is to be minimized by reasonable and prudent measures and implementing terms and conditions that are stipulated in the permit.

#### **3.b. Plant Species**

Section 9(a)(2) of the Act states that it is unlawful to remove and possess any endangered plant species from areas under Federal jurisdiction; maliciously damage or destroy any such species on any such area; or remove, cut, dig up, damage, or destroy any such species on any other area in knowing violation of any state law. In addition, endangered species, their parts or any products made from them may not be delivered, received, transported, shipped or sold in interstate or foreign commerce. As above, section 4(d) of the Act gives the Service regulatory discretion to extend the protections of section 9(a)(2) to threatened plant species.

However, the Service may give permission to remove a listed plant from areas under Federal jurisdiction, and may also give permission for actions that are otherwise

prohibited by section 9 of the Act for “scientific purposes or to enhance the propagation or survival of the affected species including, but not limited to, acts necessary for the establishment and maintenance of experimental populations.”

## EXISTING PROTECTIONS \*

## CHAPTER IV

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In addition to the Act, other existing regulations and land-management programs protect Hawai'i's threatened and endangered species and their habitats. This chapter provides an overview of these protections, including: other Federal programs, State protections for listed species, State land-use controls affecting public and private lands, county land-use controls, and land management by various public and private organizations. Land use management that applies specifically to the proposed critical habitat is summarized in Table I-1. As appropriate, this information is used in Chapter VI to estimate the section 7 economic impacts that occur over and above impacts attributable to existing protections.

### 1. FEDERAL SPECIES PROTECTIONS AND LAND MANAGEMENT

#### **1.a. Integrated Natural Resources Management Plans**

The Sikes Act Improvements Act (SAIA) of 1997 required every military installation containing land and water suitable for the conservation and management of natural resources to complete, by November 17, 2001, an Integrated Natural Resources Management Plan (INRMP). The purpose of the INRMP is to integrate the mission of the military installation with stewardship of the natural resources found there. Each military installation that has listed species or critical habitat consults with the Service on its INRMP.

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\* **Note to Reader:** Readers already familiar with existing protections in Hawai'i of threatened and endangered species and their habitats may wish to skip this chapter and proceed to the approach to the analysis (Chapter V), or to the economic analysis (Chapter VI).

### **1.b. Conservation Partnerships Program, Pacific Islands Ecoregion**

The Service's Conservation Partnerships Program is a collection of voluntary habitat restoration programs having the goal of restoring native Pacific Island ecosystems through collaborative projects with private landowners, community groups, conservation organizations, and other government agencies. The Program can provide cost-share funds, as well as information on habitat restoration techniques, native species, Safe Harbor Agreements, additional funding sources, required permits, and potential vendors of restoration services (fence contractors, nurseries, etc.). The Program is divided into five sections, discussed below.

#### **1.b.(1) Partners for Fish and Wildlife Program**

The Partners for Fish and Wildlife (PFW) Program is the Service's habitat restoration program for long-term conservation on private land. The PFW Program was established to offer technical and financial assistance to landowners who wish to restore wildlife habitat on their property. PFW Programs can include constructing fences to exclude feral ungulates; controlling feral ungulates, weeds, rodents, and alien insects; restoring native ecosystem elements such as hydrology and micro-habitat conditions; and reintroducing native species.

The Service provides assistance ranging from informal advice on the location and design of potential restoration projects to cost-shared funding under a formal cooperative agreement with the landowner. If warranted, the Service also provides participating landowners with technical assistance to develop Safe Harbor Agreements that cover habitat managed for endangered or threatened species. The Agreements provide assurances to landowners that additional land, water, and/or restrictions on uses of natural resources will not be imposed as a result of their voluntary conservation actions.

Since funding is limited, projects given the highest priority are ones that manage or reestablish natural biological communities and provide long-term benefits to declining migratory bird and fish species, and species that are endangered, threatened, or proposed for listing; and projects on private lands that satisfy the needs of wildlife populations on National Wildlife Refuges.

#### **1.b.(2) The Hawai'i Biodiversity Joint Venture**

The Hawai'i Biodiversity Joint Venture (HBJV) is a public-private effort to protect, maintain, improve, and restore the native biological diversity of the Hawaiian Islands. The mission is to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats.

The HBJV was initiated with the following goals:

- Maintain natural communities and habitats for native species
- Support efforts to cooperatively manage significant native ecosystems on public and private land
- Develop natural resource management techniques to address widespread threats (such as feral ungulates, weeds, rats, and alien insects) to Hawai'i's native ecosystems
- Restore former wetlands, native forests and other natural communities on public and private lands
- Protect native Hawaiian ecosystems and natural communities through land and water acquisition and management.

Since funding is limited, priority is given to: projects that implement management or research actions that directly contribute to protecting or restoring habitats for multiple endangered, threatened, candidate, or rare species; projects that address key threats to native ecosystems or habitats; and projects that benefit rare or unique ecosystems or habitats.

### **1.b.(3) Pacific Islands Coastal Program**

The Pacific Islands Coastal Program identifies and conserves important coastal natural resources. The goals of the program are to:

- Identify and prioritize coastal natural resources and threats
- Implement on-the-ground projects in partnership with others
- Promote public stewardship of coastal fish, wildlife, plants and their habitats.

The objectives of the program include:

- Protecting and restoring coastal wetlands and uplands, anchialine pools, estuaries, coral reefs and streams
- Preventing and eradicating invasive alien species in coastal areas
- Protecting and restoring watersheds for native species' habitat needs
- Building public support through partnerships, education and community involvement
- Inventory and map coastal resources.

#### **1.b.(4) Endangered Species Landowner Incentive Program**

The Endangered Species Landowner Incentive Program is a focused effort to combine cost-share funds and regulatory relief incentives (Safe Harbor Agreements and Candidate Conservation Agreements) to address high-priority habitat restoration needs of endangered, threatened and candidate species.

#### **1.b.(5) Other Habitat Restoration Programs**

Other Habitat Restoration Programs include the National Coastal Wetlands Conservation Grant Program and the North American Wetlands Conservation Grant Program. In addition, the Conservation Partnerships Program seeks to provide a connection between habitat restoration projects and non-Service funding sources.

#### **1.c. Wildlife Habitat Incentives Program**

Under the Wildlife Habitat Incentives Program (WHIP), the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA) provides assistance to landowners and lessees (leases must be for 5 years or more) to protect and restore Hawai'i's native habitats as well as habitats of threatened and endangered species. In Hawai'i, the focus is on the following habitats:

- Threatened/endangered plant species habitat
- Native forests/riparian areas adjacent or connected to a native forest reserve, wildlife refuge, or other preserved forest/riparian area
- Montane wetlands and bogs
- Coastal dunes that support rare plants, seabirds, monk seals or turtles
- Anchialine pools
- Endangered waterbird and migratory bird habitat
- Caves and rare species

The NRCS works with private landowners and lessees to help them develop a Wildlife Habitat Development Plan for their land that benefits native wildlife and meets other goals and objectives of WHIP. If the Plan is selected for funding, a 5- to 10-year contract is entered into whereby the landowner or lessee agrees to undertake wildlife habitat development practices such as noxious weed control, fencing, planting of native trees, and wetland restoration. In turn, NRCS reimburses the landowner or lessee 75 percent of the cost of carrying out these practices at specified rates. However, the funds cannot be used for mitigation of any kind, or on any land designated as converted wetland.

### **1.d. National Parks**

The National Parks System, operated by the National Parks Service, was established to preserve natural areas in the United States so that they can be enjoyed by current generations and preserved for future generations.

### **1.e. National Wildlife Refuges**

Over 530 National Wildlife Refuges across the United States form a system of refuges managed by the Service. Hawaii's refuges were established to protect the Islands' unique native plants and animals and their habitats. Kaua'i has three National Wildlife Refuges.

— Hanalei National Wildlife Refuge (917 acres)

This refuge in the Hanalei River Valley on the northern coast of Kaua'i is comprised of river-bottom land, taro farms, and wooded slopes. The refuge was established to protect the koloa and three other Hawaiian birds. It also provides habitat for migratory shorebirds and waterfowl.

— Huleia National Wildlife Refuge (238 acres)

This refuge, which protects the endangered Hawaiian duck (koloa), and three other Hawaiian birds, is comprised of seasonally flooded river bottom land, a river estuary, and the lush, wooded slopes of the Huleia River Valley in southeastern Kaua'i.

— Kilauea Point National Wildlife Refuge (31 acres)

About 1 mile north of the town of Kilauea on Kaua'i, this refuge is comprised of cliffs and headlands jutting up to 200 feet above the sea. Primary wildlife include red-footed boobies and shearwaters.

## **2. STATE LAND MANAGEMENT**

### **2.a. State Districting**

All lands in Hawai'i are allocated by the State into one of four districts: Conservation, Agricultural, Urban and Rural. The State, through its Department of Land and Natural Resources (DLNR) and its Board of Land and Natural Resources (the Board) has primary land-management responsibility for activities and development in the Conservation District, while the counties have primary responsibility in the Urban, Rural and Agricultural Districts.

## **2.b. The Conservation District**

The purpose of the Conservation District is to conserve, protect and preserve the State's important natural resources through appropriate management in order to promote the long-term sustainability of these natural resources, and to promote public health, safety and welfare (Hawai'i Revised Statutes, Sect. 183 C-3). To this end, limited development and commercial activity is allowed in the Conservation District. "Important natural resources" include the watersheds that supply potable water and water for agriculture; natural ecosystems and sanctuaries of native flora and fauna, particularly those which are endangered; forest areas; scenic areas; significant historical, cultural, archaeological, geological, mineral and volcanological features and sites; and other designated unique areas.

Permission is required to use land, construct facilities, or conduct many of the activities in the Conservation District (see below). Permits for routine uses or activities are issued by DLNR, while more complex activities or uses (such as certain construction projects and commercial operations) require formal approval of a Conservation District Use Application (CDUA) by the Board, and often require an approved management plan.

## **2.c. Conservation District Subzones**

All land in the Conservation District has been assigned to one of five subzones that reflect a hierarchy of uses from the most restrictive to the most permissive. These subzones are the Protective Subzone (the most restrictive), Limited, Resource, General and Special. Except for the Special Subzone, all uses and activities allowed in a more restrictive subzone in the hierarchy are allowed in the less restrictive subzones.

### **2.c.(1) Protective Subzone**

The Protective Subzone, the most restrictive of the five subzones, was established to "... protect valuable resources in designated areas such as restricted watersheds ... plant and wildlife sanctuaries ... and other designated natural and unique areas." Correspondingly, lands and waters generally included in this subzone are needed to protect watersheds, water sources, and water supplies; and to preserve the natural ecosystems of native plants and wildlife, particularly endangered species.

No structures, homes, or farm activities are allowed in the Protective Subzone, with two exceptions. First, the land can be used by State and county governments and by non-government entities that serve the public (e.g., the local utility companies) "for public purpose"—i.e., to fulfill mandated government functions for the public benefit such as transportation systems, water systems, and communications systems or

recreational facilities. Second, Native Hawaiians owning *kuleana* land may use it for agriculture or single-family residences if their land was used “historically and customarily” for these purposes. (*Kuleana* land is land that was granted to Native-Hawaiian tenants in the mid-1800s.)

Allowed uses (by permit or Board approval) in the Protective Subzone include: replacing or reconstructing an existing structure and some types of accessory structures, habitat improvements for plant and wildlife sanctuaries, Natural Area Reserves, wilderness areas and scenic areas, limited removal of certain trees, and removal of noxious plants from small areas provided that the ground is not disturbed significantly. Limited landscaping is allowed, but is restricted to plants that are endemic or indigenous; alien subspecies are specifically prohibited.

### **2.c.(2) Limited Subzone**

The Limited Subzone encompasses areas that are potentially dangerous to the public due to possible flooding, soil erosion, *tsunami* (tidal waves), volcanic activity or landslides. Lands having a general slope of 40 percent or more are also included in this subzone. The purpose of the Limited Subzone is to limit uses where natural conditions suggest that human activity should be constrained.

In addition to what is permitted in the Protective Subzone, the following activities and uses are allowed in the Limited Subzone by permit or Board approval: accessory structures near existing structures; single-family homes (one per lot) if State and county regulations are followed; agricultural activities; facilities or devices used to control erosion, floods and other hazards; botanical gardens and private parks; landscaping; and removal of noxious plants in areas larger than 10,000 square feet that result in significant ground disturbance.

### **2.c.(3) Resource Subzone**

The Resource Subzone encompasses lands that are suitable for growing and harvesting commercial timber or other forest products, park land, and land for outdoor recreation (hunting, fishing, hiking, camping and picnicking, etc.). The purpose of the Resource Subzone is to develop properly managed areas to ensure the sustained use of Hawai'i's natural resources.

In addition to what is permitted in the Protective and Limited Subzones, the following activities and uses are allowed in the Resource Subzone by permit or Board approval: commercial forestry under an approved management plan, and mining and extraction of any material or natural resource.

#### **2.c.(4) General Subzone**

The General Subzone is used to designate open space where special conservation uses may not yet be defined, but where urban uses may be premature. This subzone encompasses lands that may not be adaptable to or needed currently for urban, rural or agricultural use. The General Subzone also includes lands that are suitable for farming, flower gardening, nursery operations, orchards and grazing. Golf courses are not allowed.

In addition to what is permitted in the Protective, Limited and Resource Subzones, facilities necessary for the above-mentioned uses are allowed by permit when these facilities are compatible with the natural physical environment, and the use promotes natural open space and scenic value.

#### **2.c.(5) Special Subzone**

Special Subzones are designated for educational, recreational and research purposes. These subzones set aside lands possessing unique developmental qualities that complement the natural resources of an area.

#### **2.d. Additional Management in the Conservation District**

In addition to the five subzones in the Conservation District, the State has established further controls by defining other areas it manages within the Conservation District. These include Forest Reserves, the Natural Area Reserve system, State Hunting Units, State parks and State trails. These are discussed below.

##### **2.d.(1) Forest Reserves**

State Forest Reserves were first established in Hawai'i over a century ago to protect the supply of high-quality water that was being threatened due to the destruction of Hawai'i's rainforests. The stated purpose of a Forest Reserve is to protect native ecosystems and important watersheds (Hawai'i Revised Statutes, Sect. 183-2 and 183-17). Most of Hawai'i's Forest Reserves are in the Resource Subzone. Limited collecting for personal use (e.g., *ti* leaves and bamboo) is allowed by permit, as is limited (no more than \$3,000 value per year) commercial harvesting of timber, seedlings, greenery and tree ferns. Commercial forestry operations are allowed only with approval from the Board. Permission is required to reside in a Forest Reserve, hunt (see below), camp and fish. Land vehicles, mountain bikes, horses, mules and leashed dogs are allowed on designated roads and trails.

Collecting endangered or threatened plants or wildlife is not allowed and, except in the situations described above or with Board approval, no forms of plant or animal life may be removed, injured or killed.

## **2.d.(2) Natural Area Reserves**

A Natural Area Reserve (NAR) is based on the concept of protecting ecosystems rather than just single species, with the goal of preserving and protecting representative samples of Hawaiian biological ecosystems and geological formations (Hawai'i Revised Statutes, Sect. 195-5). Although most NARs are located in the State Conservation District, they can include land in other Districts.

Management activities in a NAR include restoring and enhancing existing populations of native plants, removing non-native weeds, and working with local hunters to keep non-native animal populations low in sensitive areas.

Permitted activities in a NAR include hiking, nature study and bedroll camping. Game hunting and research or educational activities are allowed by permit. Prohibited activities in a NAR include: improvements or construction; tent camping; vehicles, except on designated roads; and removing, injuring, killing or introducing plants or wildlife.

Kaua'i has two NARs:

- Hono o Na Pali NAR (3,150 acres)

The Hono o Na Pali NAR on the northern side of Kaua'i contains two adjacent mountain valley systems terminating in sea cliffs. The landscape is etched by several continuous and intermittent streams, and contains the sea cliffs as well as coastal, stream, wet-forest, wet-shrubland, and grassland communities. The Reserve also protects rare plants and rare stream animals and is a possible nesting site for the Hawaiian dark-rumped petrel and Newell's shearwater.

- Kuia NAR (1,636 acres)

The Kuia NAR, located a few miles west of the Hono o Na Pali NAR on the western side of Kaua'i, is characterized by gradual to moderate slopes cut by intermittent streams. The Reserve contains two rare ecosystems—a koa/'ohi'a mixed montane mesic forest and a Kaua'i diverse lowland mesic forest—as well as examples of lowland dry shrublands and montane wet forests.

### **2.d.(3) Alakai Wilderness Preserve**

The State sets aside wilderness preserves, wildlife preserves, plant sanctuaries and wildlife sanctuaries. The purpose of a State Wilderness Preserve is to preserve, protect and conserve “all manner of flora and fauna” (Hawaii Revised Statutes, Sect. 183-2 and 183-4).

The only Wilderness Preserve in the State is the 9,939-acre Alakai Wilderness Preserve (also known as the Alakai Swamp) on the summit plateau of Mt. Wai'ale'ale between 4,000 and 4,600 feet elevation. It spans portions of two Conservation District subzones: Protective and Resource.

Restrictions include no construction of buildings, roads, or horse trails except under limited conditions; no domesticated animal grazing; no introduction of plants or animals deemed to be objectionable by the Board; no overnight camping except in approved camps; and no mining.

### **2.d.(4) State Parks**

The State Parks System was established to govern the use and protection of all lands and historical and natural resources in Hawai'i's State parks (Hawai'i Revised Statutes, Sect. 184-3 and Sect. 184-5). Within State parks, approvals are required from the Board to erect communications equipment (such as aerials, antennas and transmitters), vacation cabins, and concession facilities. Activities requiring permits include limited camping, lodging (e.g., private and State cabins), fresh-water fishing, and hiking on certain trails. Uses allowed without a permit from DLNR include limited collecting of renewable products (fruits, berries, flowers, seeds, and pine cones) for personal use; hiking on most trails; picnicking; and mountain biking (unless posted signs indicate otherwise).

State-administered parks on Kaua'i include:

— Ha'ena State Park (6.7 acres)

Ha'ena State Park, on the north shore of Kaua'i, is a beach park for shore fishing and swimming; it also serves as the trailhead for the 11-mile trail Kalalau Trail that runs along the Na Pali Coast. The park offers views of ancient sea caves and the Na Pali coastline, shore fishing and swimming.

— Na Pali Coast State Park (6,175 acres)

Located on the secluded and rugged northwestern coast of Kaua'i and accessible only by trail or boat, the Na Pali Coast State Park encompasses

tall sea cliffs, lush forested valleys, numerous waterfalls, cultural sites, scenic vistas, and a variety of flora and fauna. An 11-mile trail leads along the Na Pali Coast from Haena State Park (above) to a primitive camp at Kalalau. The primary recreational activities include hiking along the 11-mile trail and into the valleys, shore fishing, camping, and game hunting. Facilities in the Park include pit toilets and rudimentary camp grounds.

— Koke'e State Park (4,345 acres)

Koke'e State Park lies *mauka* (on the mountain side) of the Na Pali Coast State Park (above). Located in a mountainous part of the island, scenic lookouts provide an opportunity to view the Na Pali Coast and valleys in the Park. On its southern boundary, the Koke'e State Park adjoins Waimea Canyon State Park (below).

The Park offers views of the lush, amphitheater-headed Kalalau Valley from a lookout at the 4,000-foot elevation, wildland picnicking, tent camping, lodging, pig hunting, and hiking in native rain forests and along the rim of Waimea Canyon with additional trails into neighboring Forest Reserves.

Facilities in the Park include a concession, lodging, camping, picnicking, restrooms and scenic lookouts.

— Waimea Canyon State Park (1,866 acres)

Waimea Canyon State Park, adjacent to and south of Koke'e State Park, is a slender parcel of land that follows the upper end of the Waimea River for approximately 5 miles. The Park overlooks Waimea Canyon and offers views across to the island of Ni'ihau, wildland picnicking, fishing, and a short nature trail. Park facilities include picnic areas, restrooms, and the scenic overlooks.

— Polihale State Park (138 acres)

Polihale State Park is in western Kaua'i at the end of a 5-mile-long dirt road past the Pacific Missile Range Facility (PMRF). The Park encompasses coastal lands on a wide sand beach backed by tall dunes.

The primary recreational activities at this beach park include swimming, camping, picnicking, and shore fishing. Facilities include a camping area, a picnic pavilion, and restrooms. Also, a *heiau* (a Hawaiian place of worship or shrine) is located on the northeastern boundary of the Park.

#### **2.d.(5) Hunting Units**

A total of 47 Hunting Units, administered by DLNR, have been established across the State to control game hunting (Hawaii Administrative Rules, Title 13, Chapters 122 and 123). On Kauai, game animals and birds hunted include feral pigs and goats, black-tailed deer, pheasant (3 species), Japanese quail, Francolin (3 species), and dove (2 species).

Hunting is a licensed activity and is restricted within the Hunting Units. Restrictions address: bag limits, hunting seasons, days allowed, hours of the day, and hunting method (rifle, muzzleloader, handgun, bow and arrows). Game hunting restrictions on private land are set by the landowner. DLNR's intent is to manage the hunting areas, game-mammal populations, and the level of hunting activity to achieve a reasonable balance between (1) recreational benefits for hunters and (2) protection to native ecosystems and threatened and endangered plants.

#### **2.d.(6) State Trail and Access Program**

The purpose of the State Trail and Access Program is to preserve and perpetuate the integrity, condition, naturalness and beauty of State trails and surrounding areas, and to protect ... environmental resources (Hawai'i Revised Statutes, Sect. 198D-11 and 198D-6).

Activities allowed under this program by permit from DLNR include camping, hunting and fishing. Some trails are designated for commercial activity (e.g., commercial hikes on designated trails), but no commercial activity is permitted on a trail if it will compromise the quality and nature of the experience or cause any damage to the integrity or condition of the trail or the surrounding environment. Prohibited uses include collecting, removing, injuring or killing a plant or animal; and introducing plants or wildlife.

#### **2.d.(7) Natural Area Partnership (NAP) Program**

Under the Natural Area Partnership (NAP) program, the State provides two-thirds of the management costs for private landowners who agree to permanently protect intact native ecosystems, essential habitat for threatened and endangered species, or areas with other significant biological resources. The NAP program can support a full range of management activities to protect, restore, or enhance significant native resources or geological features.

To qualify, the applicant must be a landowner or manager of private lands of high natural area quality. Other requirements include: (1) permanent dedication of the private lands through a transfer of fee title or a conservation easement to the State or a “cooperating entity” such as The Nature Conservancy of Hawai'i, and (2) management of the lands according to a detailed management plan approved by the Board of Land and Natural Resources. A “cooperating entity” is a private non-profit landholding organization or any other body deemed by DLNR to be able to assist in the management of natural areas.

#### **2.d.(8) Hawai'i Endangered Bird Conservation Program**

The Hawai'i Endangered Bird Conservation Program is a partnership composed of non-profit conservation organizations, private landowners, and government agencies including DLNR and the Service.

The mission of the Program is to recover native Hawaiian ecosystems at the landscape level and to establish self-sustaining bird populations in the wild, using management programs that include captive propagation and reintroduction. Their efforts employ an integrated conservation strategy of research, habitat management, and public education, with a focus on ecosystem health and protection as a prerequisite to reintroduction.

On Kaua'i, the focus of the program is on conservation efforts in the Alaka'i Swamp for the endangered *Puaiohi* bird.

### **3. STATE SPECIES PROTECTIONS**

#### **3.a. Protection of Threatened and Endangered Wildlife and Ecosystems**

The State has established various laws and administrative rules to protect threatened and endangered wildlife and their ecosystems. The Administrative Rule “Indigenous Wildlife, Endangered and Threatened Wildlife, and Introduced Wild Birds,” implements a State act that was specifically designed to conserve, manage, protect and enhance indigenous wildlife, endangered and threatened wildlife, and introduced wild birds (Hawai'i Administrative Rules, Chapter 13-124). The State list of threatened and endangered species includes by reference species on the Federal list.

With regard to threatened and endangered wildlife species, prohibited activities include *taking*, possessing, processing, selling, offering for sale, or transporting these species. Nor can their nests be removed, damaged or disturbed, or their young, eggs, dead body or skin be removed from the State of Hawai'i. Nor does DLNR issue permits

to destroy or otherwise control threatened or endangered species of wildlife or introduced wildlife. However, these rules do not apply to authorized employees of DLNR, the State Department of Agriculture, and the Service if the employees are acting in the course of their official duties.

Similarly, the State has established various laws and administrative rules to protect threatened and endangered plants and their ecosystems, which in turn helps protect wildlife. The Administrative Rule “Threatened and Endangered Plants,” implements a State act that was specifically designed to conserve, manage, protect and enhance native threatened and endangered plants (Hawai'i Revised Statutes, Sect. 195D). Prohibited activities include the taking, selling, delivering, carrying, shipping, transporting, or exporting of any native endangered or threatened plant. However, license holders may sell such plants if the plants are garden-grown.

And, as discussed above, additional protections of threatened and endangered wildlife and ecosystems are embedded in separate laws governing the State Conservation District, State Forest Reserves, State parks, and designated state trails. Also, the state has laws to protect, conserve and preserve ecosystems in NARs, as well as native ecosystems and important watersheds in State Forest Reserves. Under the NAP program, the State shares in the land management costs of private landowners who agree to permanently protect intact native ecosystems, essential habitat for threatened and endangered species, or areas with other significant biological resources. Limited taking of flora is allowed, but only in State parks and State Forest Reserves, and only if the flora is not endangered or threatened. In State parks, collecting or gathering reasonable quantities of natural renewable products—such as fruits, berries, flowers, seeds, and pine cones—is allowed for personal use without a permit. In Forest Reserves, limited collecting for personal use (e.g., *ti* leaves and bamboo) and limited commercial harvesting (e.g., timber, seedlings, greenery and tree ferns) is allowed by permit. Commercial forestry operations are allowed only with approval of the Board.

### **3.b. State Environmental Assessments and Environmental Impact Statements**

Hawai'i State law calls for efforts to prevent or eliminate damage to the environment and biosphere and to protect endangered species and indigenous plants and animals. To meet this and other goals, Hawai'i's Environmental Impact Statement (EIS) law (Hawai'i Revised Statutes 343), which is administered by the State Office of Environmental Quality Control (OEQC), requires that an Environmental Assessment (EA) and/or EIS be prepared for many development projects. The law requires that government give systematic consideration to the environmental, social and economic consequences of proposed development projects before granting permits for construction. For impacts on biological resources, OEQC guidelines call for biological

surveys, an ecosystem impact analysis, and proposed mitigating measures. The requirements and guidelines apply to development projects in the four State Agricultural, Urban, Rural and Conservation Districts.

#### **4. COUNTY LAND MANAGEMENT**

While the State manages land in the Conservation District, the counties have primary management responsibility for land in the other three State Districts: Agricultural, Urban and Rural. Also, development along the shoreline is subject to county regulation, regardless of State districting.

##### **4.a. Agricultural District**

The Agricultural District includes good farm land and, from an agricultural perspective, land that is commonly referred to as “junk land” because it is unsuitable for farming or ranching. “Junk land” includes gulches, steep hillsides, rocky land and, on Maui and the Big Island, even relatively recent lava flows having little or no topsoil. This districting of “junk land” into the Agricultural District reflects the fact that this district is a catch-all category that includes all lands not otherwise categorized, regardless of the agricultural quality of the land.

Crops, livestock and grazing are permitted in the Agricultural District, as are accessory structures and farmhouses. Although land in the Agricultural District is not meant to be urbanized it is, in practice, sometimes used for large-lot subdivisions. On Kaua'i, most of these subdivisions are on former sugarcane land where few listed species are found.

Listed species are found in some parts of the Agricultural District, particularly in gulches, on hillsides, and on some of the land that is used for low-intensity grazing. In many cases, the fact that the land is in the Agricultural District indirectly protects listed species by limiting urban sprawl.

##### **4.b. Rural and Urban Districts**

Land-use and development in the State Urban and Rural Districts are subject to county regulations, including the county general plan, community plans, zoning, and building code regulations.

Before developer-initiated changes to the county general plan or community plans are approved, developers are required to address the impacts of their projects on rare, threatened, or endangered species or their habitat, and mitigate any adverse impacts.

#### **4.c. Special Management Areas**

As mandated by Hawai'i Coastal Zone Management program (Chapter 205A, Hawai'i Revised Statutes and Public Law 92-583), counties have an additional layer of regulation that provides special controls on development in Special Management Areas (SMAs) located along the shoreline. Most development in an SMA requires an SMA Use Permit from the county where the development is proposed. The intent is to avoid the permanent loss of valuable resources and to ensure adequate access to beaches, recreation areas and natural reserves.

### **5. OTHER LAND MANAGEMENT**

Other land management activities that are not the responsibility of the State or of county governments are discussed below.

#### **5.a. TNCH Preserve**

The Nature Conservancy of Hawai'i (TNCH) is a private, non-profit affiliate of a national organization that works with Federal, State and private partners to protect Hawai'i's natural areas that shelter native species. The mission of TNCH is to preserve Hawai'i's native plants, animals, and natural communities by protecting the lands and waters needed for their survival.

Existing and possible TNCH preserves on Kaua'i include:

— Kaluahonu Preserve (213 acres)

Located in the southeast corner of the island, this Preserve is the largest privately owned nesting site for the Newell's Shearwater, a threatened sea-bird species. TNCH leases the land from Grove Farm.

— Wainiha Valley (possible 10,000-acre preserve)

TNCH is working with Alexander & Baldwin, Inc. (A&B), owner of most of Wainiha Valley to allow TNCH to manage about 10,000 acres of the valley. These lands are currently leased to DLNR and managed by DLNR.

— Lumaha'i Valley (possible preserve)

TNCH and Kamehameha Schools, owner of Lumaha'i Valley, are considering entering into an agreement that would allow TNCH, in collabora-

tion with the Waipa Foundation, to manage the Lumaha'i Valley for conservation and for educational and cultural benefits.

**5.b. National Tropical Botanical Gardens**

The National Tropical Botanical Garden (NTBG) is dedicated to the conservation of tropical plant diversity, particularly rare and endangered species. The NTBG, which is supported by private contributions, operates three gardens on Kaua'i:

- Limahuli Garden and Preserve (1,000+ acres)

This garden is located in Limahuli Valley on Kauai's north shore.

- McBryde Garden (252 acres)

Located in the Lawa'i Valley on the south shore, this garden is the site of the NTBG's headquarters with research, education and propagation facilities.

- Allerton Garden (100+ acres)

This garden, which is located in Lawa'i Valley next to the McBryde Garden, is managed by NTBG for the Allerton Gardens Trust.

## **APPROACH TO THE ECONOMIC IMPACT ANALYSIS \***

## **CHAPTER V**

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This chapter presents the approach used in Chapter VI to estimate the economic impacts of the section 7 listing and critical habitat provisions of the Act on projects, land uses and activities in proposed critical habitat for particular species. First, the scope of the economic analysis is described. This is followed by a discussion of the analytical concepts and steps used to conduct the analysis.

### **1. SCOPE OF THE ANALYSIS**

The parameters below define the scope of the economic analysis.

#### **1.a. Time Horizon for the Analysis**

A 10-year time horizon is used because many landowners and managers do not have specific plans for projects beyond 10 years. In addition, the forecasts in this analysis of future economic activity are based on current socioeconomic trends and the current level of technology, both of which are likely to change over the long term.

#### **1.b. Projects, Land Uses and Activities Subject to Analysis**

The analysis focuses primarily on the "reasonably foreseeable" projects, land uses, and activities that could affect the physical and biological features of the proposed critical habitat units. In turn, these are the activities that could be affected by the critical habitat designation.

"Reasonably foreseeable" projects, land uses, and activities are defined for the purposes of this report as those which are (1) currently authorized, permitted, or funded;

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\* **Note to Reader:** Readers who are already familiar with the approach to the analysis may wish to skip this chapter and proceed to the economic analysis in Chapter VI.

(2) proposed in plans currently available to the public; or (3) projected or likely to occur within the next 10 years based on (a) recent economic or land-use trends, development patterns, evolving technologies, competitive advantages, etc., and (b) limits imposed by land-use controls, access, terrain, infrastructure, and other restrictions on development. Current and future activities that could potentially result in section 7 consultations and/or project modifications are considered to be reasonably foreseeable.

## **2. ANALYTICAL CONCEPTS AND STEPS**

The approach used to estimate the economic impacts on specific projects, land uses and activities in areas proposed for critical habitat involved, as appropriate, the analytical concepts and steps described below.

### **2.a. Background Information**

In order to provide context for the analysis, and to the extent that information was reasonably available, background information was obtained on projects, land uses, and activities that may potentially be affected by the proposed designation. Depending upon the situation, this background information included some or all of the following: (1) the location of a project, land use, or activity; (2) a description of the project, land use, or activity, including its magnitude; (3) the amount of economic activity associated with the project, land use, or activity (e.g., revenues and employment); (4) past section 7 consultations, project modifications and associated costs; and (5) whether the project site is within the geographic area known to be *occupied* by listed species other than those in the current proposal.

### **2.b. Federal Involvement**

For the current and planned projects, land uses, and activities that may affect the physical and biological features of the proposed critical habitat units, the next step in the analysis was to determine *Federal involvement*. As discussed in Chapter III, Federal agencies must consult with the Service whenever an activity they fund, authorize, or carry out may affect designated critical habitat. When consultations concern an activity on Federal lands, the relevant Federal agency consults with the Service. When consultations involve an activity proposed by a State or local government or by a private entity, the Federal "Action agency" to the activity consults with the Service.

Activities on State, county, municipal and private lands that do not have a *Federal nexus* (i.e., they do not involve Federal funding, a Federal permit, or other Federal actions) are not restricted by critical habitat designation. Therefore, these activities were not addressed further in the analysis.

In practice, not every single project, land use, and activity that has a *Federal nexus* has been subject to section 7 consultation with the Service. Thus, the analysis was further confined to those projects, land uses, and activities which are, in practice, likely to be subject to consultation. This assessment was based on a review of past consultations, current practices, and the professional judgments of Service and other Federal agency staff.

### **2.c. Exclusion of Human-Made Features and Structures**

In practice, the critical habitat provisions of section 7 do not apply to the operation and maintenance (O&M) of existing human-made features and structures because these features and structures normally do not contain, and are not likely to develop, any *primary constituent elements*. Examples of human-made features and structures include buildings, roads, aqueducts, telecommunications equipment, arboreta and gardens, and *heiau* (a Hawaiian place of worship or shrine). As a result, O&M of human-made features and structures were not considered further in the analysis.

An equivalent interpretation is that existing human-made features and structures are unmapped holes that are within the boundaries of a critical habitat unit, but are not part of the unit.

### **2.d. Existing Protections**

The next step in the analysis involved identifying the impacts on activities that were expected to result from existing protections unrelated to section 7 (e.g., other existing Federal, State, and county land-use controls and environmental protections). If some other existing statute, regulation, or policy limits or prohibits a project, land use, or activity, the economic impacts associated with those limitations or prohibitions are not attributable to section 7 listing provisions and/or critical habitat provisions. For example, State protections include land-use restrictions for activities in the State Conservation District and specific protections of threatened and endangered species and their ecosystems.

### **2.e. Consultations and Project Modifications**

For current and planned projects, land uses, and activities that are likely to be subject to consultations under section 7 of the Act, the next step in the analysis was to estimate (1) the quantity and nature of the consultations (e.g., formal or informal); and (2) changes that are likely to occur in such items as project designs, schedules, land uses, activities and programs.

The estimates reflect the availability of information which, in many cases, was limited (e.g., the outcome of future consultations will not be known until they occur).

## **2.f. Economic Costs**

The next step in the analysis was to estimate the costs of consultations and the changes to projects, land uses and activities prompted by implementing the section 7 provisions. The types of economic costs that were considered included, but were not limited to, changes in revenues, costs, and property values. The analysis then determined what proportion of those section 7-related costs were attributable solely to the critical habitat provisions of section 7 (as opposed to the listing provisions).

## **2.g. Qualitative Impacts**

In some cases, costs were described but were not quantified for one or more of the following reasons: (1) the economic impacts attributable to both the species listing and the critical habitat are expected to be small; (2) the probability that the impacts will occur is small; (3) the impacts are highly speculative; or (4) data needed to quantify impacts are not reasonably available.

## **2.h. Economic Benefits**

The final step in the analysis was to estimate the benefits (e.g., species preservation) associated with the section 7 listing and critical habitat provisions. In most cases, a qualitative discussion of benefits is provided because market prices or existing economic studies on which to base values are not available (e.g., the economic value of preserving certain species).

The approach outlined above relied primarily on information provided by the Service; the State of Hawai'i's Department of Land and Natural Resources (DLNR); county planning departments; other Federal, State and county agencies; public and private landowners and land managers; affected companies; and other interested parties.

## **3. SOURCES OF INFORMATION**

The approach described above relied primarily on information provided by the Service (GIS map overlays, acreage tables, public testimony and comment letters on prior critical habitat proposals, etc.); DLNR; the State Department of Business, Economic Development & Tourism (DBEDT); county planning departments; other Federal, State and county agencies; public and private landowners and land managers; affected

companies; and other interested parties. Public documents used included *Hawai'i Revised Statutes* and *Hawai'i Administrative Rules* related to land use, *The State of Hawai'i Data Book*, applicable county land-use plans, and property tax data.

## ECONOMIC COSTS AND BENEFITS

## CHAPTER VI

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### 1. INTRODUCTION

As noted in the Preface, the Service may exclude an area from critical habitat designation if it determines that the benefits of excluding an area outweigh the benefits of inclusion. To aid in this determination, this chapter presents an analysis of the section 7-related economic costs and benefits associated with listing the Snail as a threatened species and with designating critical habitat for the Snail. However, the Service cannot exclude an area if it determines that the exclusion will result in the extinction of the species.

As explained in Chapter V, the methodology for this economic analysis involves estimating both: (1) the total section 7-related economic costs and benefits (also referred to as economic impacts) of the Snail listing and critical habitat designation; and (2) the subset of these costs and benefits that is solely attributable to critical habitat designation. As a result, for each potential impact, the analysis presents two estimates:

- **Total Section 7 Costs and Benefits.** These estimates include the economic impacts likely to occur from implementing both the species listing provision and the critical habitat provision of section 7 of the Act.
- **Costs and Benefits Attributable to Critical Habitat.** These estimates represent those portions of the section 7-related economic impacts that are most likely attributable to the proposed Snail critical habitat designation but not to the Snail listing.

### 2. DIRECT SECTION 7 CONSULTATION COSTS

#### **2.a. Past Section 7 Consultations**

Service records indicate that from the time the Snail was listed in January 2000 until critical habitat was proposed, the Service conducted no informal or formal section 7 con-

sultations because there was no activity in the proposed area that was subject to section 7 provisions. However, consultations did take place for other listed species (e.g., listed plants and birds) that are found in the proposed Snail critical habitat. These consultations concerned game management and hydropower development and are discussed later in this chapter.

## **2.b. Cost of a Typical Section 7 Consultation and Biological Survey**

### **2.b.(1) Focus of Consultation**

For the Snail, the proposed rule indicates that future section 7 consultations would likely focus on projects and activities that are within or upstream of the proposed critical habitat, or which could directly or indirectly destroy or degrade the habitat, including:

— Projects and activities having direct effects

Reduction or redirection of stream or spring water flow, dam construction, channel alteration or realignment, substrate alteration, or other direct means (e.g., pesticide or herbicide application, waste discharge, groundwater withdrawal, groundwater contamination, reduction of groundwater recharge, etc.).

— Projects and activities having indirect effects

Introduction or promotion of potential predators, diseases or disease vectors, vertebrate or invertebrate food competitors, invasive plant species, watershed degradation through over-grazing, augmentation of feral ungulate populations, an altered fire regime, or other activities that degrade water quality or quantity to an extent that detrimentally affects stream structure and function.

### **2.b.(2) Cost of Consultation**

As discussed in Chapter III, participants in a consultation may include the Service, the Federal Applicant or Federal Action agency, and possibly a non-Federal applicant. Although the Service does not charge fees for its consultations, participants in consultations normally spend time assembling information about the site and their proposed project or activity; preparing for one or more meetings; participating in meetings; arranging for biological surveys and any associated reports; and responding to correspondence and phone calls.

For three levels of complexity (Low, Medium or High), Table VI-1 gives the estimated cost to those participating in consultations with the Service. The estimate is based

**Table VI-1—Estimated Cost of a Section 7 Consultation  
and Biological Survey**

| <u>Item</u>                                   | <u>Low</u>     | <u>Medium</u>   | <u>High</u>     |
|---|----------------|-----------------|-----------------|
| <b>Consultation</b>                           |                |                 |                 |
| Federal Action Agency or<br>Federal Applicant | \$2,200        | \$ 6,400        | \$10,700        |
| U.S. Fish & Wildlife Service                  | <u>\$1,600</u> | <u>\$ 5,100</u> | <u>\$10,000</u> |
| <b>Total for Federal Agencies</b>             | <b>\$3,800</b> | <b>\$11,500</b> | <b>\$20,700</b> |
| Non-Federal Applicant (if any)                | <u>\$1,400</u> | <u>\$ 4,200</u> | <u>\$ 8,200</u> |
| <b>Total (if a Non-Federal<br/>Applicant)</b> | <b>\$5,200</b> | <b>\$15,700</b> | <b>\$28,900</b> |
| <b>Biological Survey (if needed)</b>          | <u>\$4,700</u> | <u>\$ 6,000</u> | <u>\$ 7,400</u> |
| <b>TOTAL</b>                                  | <b>\$9,900</b> | <b>\$21,700</b> | <b>\$36,000</b> |

**Source:** Project consultants and U.S. Office of Personnel and Management, 2002 General Schedule Salary Table.

on: (1) a review of consultation records across the country related to other critical habitat rulemakings; (2) the typical amount of time spent by all participants; and (3) the relevant standard hourly rates and overhead allowances for the Service, other Federal agencies, and private applicants in Hawai'i.

As indicated in the table, consultation costs could range from as little as \$3,800 to as high as \$20,700 if only Federal agencies are involved, and from \$5,200 to \$28,900 if there is a non-Federal applicant.

### **2.b.(3) Cost of Biological Survey**

If a biological survey is needed, then the costs could range from as little as \$4,700 for a standard survey to as as much as \$7,400 for more complex, environmentally sensitive, or politically sensitive survey (see Table VI-1). This cost is based on: (1) 3 to 6 person-days of field and office work; (2) biologist services at \$750 per day; (3) travel costs of \$1,000 to \$1,500 for airfare from O'ahu, car rental and per diem; and (4) 2 hours of helicopter time at \$700 per hour.

#### **2.b.(4) Total Cost**

For a non-Federal applicant, and assuming that a biological survey is needed, the total estimated cost for the consultation and the survey ranges from a low of \$9,900 to a high of \$36,000 (see Table VI-1).

#### **2.c. Management of Game Hunting**

##### **2.c.(1) Game-Management Issue**

One of the major issues surrounding the critical habitat designations proposed in Hawai'i concerns the management of game-mammals (i.e., feral pigs, goats, deer and sheep). Game-mammal management is a highly sensitive issue throughout the State that has been debated for many decades.

The debate centers primarily on the damage ungulates do to threatened and endangered plants. However, the proposed rule indicates that an increase in feral ungulate populations may indirectly impact the Snail through watershed degradation, increased siltation of rivers and streams, and an increased potential for landslides.

While many hunters accept the need to protect portions of the native forest from damage by ungulates, the majority of hunters are opposed to removing game mammals from large portions of existing hunting areas. Furthermore, many hunters fear that critical habitat designations could lead to a loss of prized hunting areas as was the case with the court-ordered eradication of sheep and goats from the *Palila* critical habitat on the Island of Hawai'i 20 years ago. Instead, most hunters advocate that game-mammal populations continue to be sustained at levels that are sufficient to allow recreational and subsistence hunting in all but possibly a few of the existing Hunting Units. Hunters also see themselves as important contributors to controlling feral ungulate populations at reasonable levels at little cost to the taxpayer.

Hunters and DLNR have also expressed a general concern that critical habitat designation could affect wildlife management projects that are partially funded by the Service under the Pittman-Robertson Act discussed below.

##### **2.c.(2) Affected Units and Acreage**

All of the Na Pali Coast Streams units (Kalalau Stream, Hanakoa Stream and Hanakapi'ai Stream) and the Hanalei River unit, the Makaleha Stream and Springs unit, and the North Fork Wailua River unit overlap with 3,166 acres of public Hunting Units which comprise about 2.5 percent of the 126,202 acres of Kaua'i's State-managed Hunting Units. In addition, the proposed critical habitat units may include private lands that

are available for game hunting but are not managed by DLNR as part of the State game management areas. Public access to some of these private lands is limited.

### **2.c.(3) Economic Impact on Game Management**

Activity: Game management and public hunting

Federal Involvement: Federal funding under the Pittman-Robertson Act for State-managed lands; none for private lands.

The *Federal involvement* is the Federal funding provided to DLNR by the Service to restore and rehabilitate wildlife habitat and to support wildlife management research—part of the Federal Aid in Wildlife Restoration Act, which is commonly referred to as the Pittman-Robertson Act. In Hawai'i, total funding amounted to nearly \$1.1 million for FY2001, of which about \$817,000 is Federally-funded and about \$272,000 is State-funded. Kaua'i County receives about \$200,000 annually for its game-management program plus another \$50,000 for non-game programs.

Presence of Other Listed Species and Critical Habitat for Other Species: Listed plants and wildlife, and proposed plant critical habitat on Kaua'i

Consultations and Costs:

- Total Section 7 Costs: \$3,000

Because of the presence of listed plants and wildlife throughout most public hunting lands, DLNR consults with the Service once every 5 years on wildlife management projects that are partially funded under the Pittman-Robertson Act. Historically, these consultations have not taken the Snail into consideration because the Snail was listed quite recently (January 2000). The critical habitat designation may cause the Service to increase the scope of the section 7 consultation to assess impacts on the Snail. This analysis assumes that the increase in scope will involve a Service biologist familiar with the Snail to review the proposed projects. The cost estimate is based on 2 days of time at approximately \$750 per day. Two consultations over 10 years increases the cost to \$3,000.

- Cost Attributable to Critical Habitat: \$3,000

As noted above, the increase in the scope of these consultations will be due specifically to the designation of critical habitat for the Snail.

Project Modifications: None anticipated

As indicated in the proposed rule, feral ungulates may indirectly affect the Snail if their numbers are allowed to increase sufficiently to degrade the watershed. However, DLNR does not plan to change its management of ungulate populations to increase their numbers in the hunting areas that overlap the proposed Snail critical habitat units (i.e., the upper reaches of Kalalau Stream, Hanakoa Stream, Hanakapi'ai Stream, Hanalei River, Makaleha Stream and Springs and the North Fork Wailua River units). Currently, the most liberal hunting is allowed in these areas.

In summary, no modifications to game management or public hunting are anticipated because DLNR's current practices are unlikely to affect the Snail.

## **2.d. State Parks Management**

### **2.d.(1) State Parks Included Within Proposed Critical Habitat**

Almost all of the three Na Pali Coast Units are in the Na Pali Coast State Park. The main activities in this park include hiking along the Kalalua Trail and primitive camping at various campsites. The proposed critical habitat units include portions of the Kalalau Valley, Hanakapi'ai Falls, and the Hanakoa Falls trails. In addition, the proposed Hanakoa Stream critical habitat may contain portions of the primitive Hanakoa campsite.

### **2.d.(2) Economic Impact on State Parks Management**

Potential Activity, next 10 Years: Improvements to campsites, trail realignments

DLNR staff on Kaua'i indicate that there are no plans for additional trails or campsites within the proposed critical habitat units, and there are no plans to expand the Hanakoa campsite. Some of the existing trails may need to be realigned in the future if they are affected by landslides, erosion, or other hazardous conditions.

Federal Involvement: None

Any trail realignment project is likely to be relatively small and funded entirely by the State, with no *Federal involvement*.

Anticipated Costs of Consultations and Project Modifications: None

No consultations or project modifications involving recreational improvements in the Na Pali Coast State Park are anticipated because there is no *Federal involvement*.

## **2.e. Conservation Projects**

### **2.e.(1) Partners for Fish and Wildlife Program**

The Partners for Fish and Wildlife (PFW) Program is the Service's habitat restoration program for long-term conservation on private land. The Service provides assistance ranging from informal advice on the location and design of potential restoration projects to cost-shared funding under a formal cooperative agreement with the landowner. Additional information about the PFW program is provided in Chapter IV.

The Service is currently working on a PFW program with the primary private landowner in the upper Lumaha'i Valley. The Service has completed spot surveys of the natural resources in the valley and is developing a document of management recommendations for the entire valley, including the Lumaha'i River proposed critical habitat unit. When the document is complete, the landowner will review it and determine whether to pursue any or all of the recommended restoration projects.

### **2.e.(2) Economic Impact on PFW Programs**

Potential Activity, next 10 Years: Private lands restoration

The private landowner may agree to one or more restoration projects, or possibly none.

Federal Involvement: Partial funding from the Service

Presence of Other Listed Species and Critical Habitat for Other Species: Possible, depending upon the location of the restoration projects.

#### Consultations and Costs

Possible informal internal Service consultation. The private landowner need not be involved.

- Total Section 7 Costs: \$3,800

Estimate is based on (1) one restoration project on private lands in the next 10 years, (2) the Low cost from Table VI-1 (consultation with a Federal agency as the Applicant), and (3) no biological survey because the Snail locations are known. While other listed species may be present, this analysis conservatively assigns all costs of the consultation to the Snail even though the consultation may also address the other listed species.

- Cost Attributable to Critical Habitat: \$0

Lumaha'i Valley contains one of the largest known Snail populations, so the project would already be subject to consultation even without the critical habitat designation.

Anticipated Project Modifications and Costs: None

Since the consultation will be conducted on restoration projects designed by the Service, the likely outcome of the consultation is that the project promotes conservation and is unlikely to adversely affect the Snail or other listed species. Thus, no project modifications are anticipated.

### **2.e.(3) Potential TNCH and Waipa Foundation Land Management**

The Nature Conservancy of Hawai'i (TNCH) and Alexander & Baldwin, Inc. (A&B), the private landowner of most of Wainiha Valley, are considering entering into an agreement that would allow TNCH to manage about 10,000 acres of the valley. Currently, A&B leases the valley to DLNR who manages the land.

Similarly, TNCH and Kamehameha Schools, who owns most of Lumaha'i Valley, are considering entering into an agreement that would allow TNCH to manage the valley in collaboration with the Waipa Foundation. These lands will be managed for conservation and for educational and cultural benefits.

If these agreements are implemented, TNCH will develop a master plan for each valley and conduct conservation projects designed to protect the entire ecosystem and the diverse native species. In order to complete these projects, it is likely that TNCH will seek funding from private foundations, DLNR, and the Service.

### **2.e.(4) Economic Impact on Potential TNCH and Waipa Foundation Land Management**

Potential Activity, next 10 Years: Conservation projects in the Wainiha and Lumaha'i Valleys

Federal Involvement: Partial funding from the Service

Presence of Other Listed Species and Critical Habitat for Other Species: Possible, depending upon the location of the conservation projects.

### Consultations and Costs

If TNCH or the Waipa Foundation request funding from the Service, the Service will conduct an internal informal consultation. TNCH and the Waipa Foundation could be involved in the consultation.

- Total Section 7 Costs: \$10,400

Estimate is based on (1) Federal funding of conservation projects to implement two plans (one for each valley), (2) Low cost from Table VI-1 of a consultation with a non-Federal Agency as the Applicant, and (3) no biological survey because the Snail locations are known. While other listed species may be present, this analysis conservatively assigns all costs of the consultation to the Snail even though the consultation may also address the other listed species.

- Cost Attributable to Critical Habitat: \$5,200

While Lumaha'i Valley is home to a Snail population, there are no known Snail populations in Wainiha Valley. Thus, in the absence of critical habitat designation, section 7 consultation involving the Snail would occur for Lumaha'i Valley but not for Wainiha Valley.

### Anticipated Project Modifications and Costs: None

Since Service-funded projects are generally designed to promote the conservation of endangered species, it is unlikely that proposed activities would adversely affect the Snail.

## **2.e.(5) Potential Watershed Partnership Programs**

The Kaua'i County Board of Water Supply and various landowners and land managers on Kaua'i are considering entering into a watershed partnership similar to those currently in place on other islands. If the plans for the watershed partnership are finalized, the affected area could include most of the land in the Conservation District on Kaua'i. Management activities in other watershed partnerships in Hawai'i have been designed to enhance water retention and to control threats to the watershed. Since all of the proposed critical habitat for the Snail are in the Conservation District, all of the units could be included in the watershed partnership.

## **2.e.(6) Economic Impact on Potential Watershed Partnership Programs**

Potential Activity, next 10 Years: Selected reforestation, feral ungulate control, etc.

Federal Involvement: Potential funding provided by the Service and other Federal agencies

Presence of Other Listed Species and Critical Habitat for Other Species: Probable, depending upon the location of the restoration projects

### Consultation and Costs

If a watershed partnership requests funding from the Service, the Service will conduct an internal informal consultation. A representative of the watershed partnership may be involved.

- Total Section 7 Costs: \$1,500

Because of the presence of listed plants and wildlife throughout most of the potential watershed partnership area, it is likely the Service will conduct an internal section 7 consultation on funding it provides for conservation projects that implement part of the watershed management plan. Critical habitat designation may cause the Service to increase the scope of the section 7 consultation to assess impacts on the Snail. This analysis assumes that the increase in scope will involve a Service biologist familiar with the Snail to review the proposed projects. The cost estimate is based on 2 days of time at approximately \$750 per day.

- Cost Attributable to Critical Habitat: \$1,500

As noted above, the increase in scope of these consultations will be due specifically to the designation of critical habitat for the Snail.

Anticipated Project Modifications and Costs: None

Since watershed partnership projects are designed to enhance the quality of the watershed, it is unlikely that proposed activities would adversely affect the Snail.

## **2.f. Water Systems**

### **2.f.(1) Existing Water Systems Within Proposed Critical Habitat**

As indicated in Table I-1, components of water systems are located in four of the proposed critical habitat units. These include a gaging station in the Wainiha River unit, stream diversions that are abandoned and in disrepair in the Hanalei River unit, a water-

diversion weir and portions of the Kealia Ditch in the Waipahe'e Stream unit, and a gaging station and portions of the Waiahi-Ililiula-North Wailua Ditch in the North Fork Wailua River unit. The diversion structures, ditches and tunnels were built by private landowners to divert water to irrigate agricultural fields or to power hydropower plants. Currently, some systems are operated and maintained by the State Department of Agriculture, some by private parties, while others are not maintained at all.

## **2.f.(2) Impact on Existing Water Improvements**

Potential Activity, next 10 Years: Operation and maintenance (O&M) of existing water improvements

Water improvements require periodic maintenance to insure that pumps continue to run, leaks are detected and repaired, vegetation is cleared from ditch systems, etc.

Federal Involvement: None

The O&M is funded entirely by the State and private organizations.

Human-made Features: Yes

Anticipated Costs of Consultations and Project Modifications: None

No consultations or project modifications would be required for O&M of existing water systems because there is no *Federal involvement*. In addition, human-made features lack the *primary constituent elements* for the Snail, and therefore are not subject to the critical habitat provisions of section 7.

## **2.f.(3) New Water Improvements**

The private landowners indicate that there are no plans to construct or augment water-diversion facilities in, or upstream of, the proposed critical habitat units. In Wainiha Valley, the last water diversion was built in 1953, and A&B plans no new diversions. Instead, the valley is being managed by DLNR for conservation and will continue to be managed for conservation, possibly by TNCH (see Section 2.e.(3) above). Furthermore, a water diversion for irrigation or other purposes would reduce the flow of water to A&B's hydroelectric plant, thereby reducing the amount of energy the plant can produce.

Similarly, Kamehameha Schools has no plans for water diversions in Lumaha'i Valley. Instead, the valley is to be managed for conservation and for educational and cultural benefits, possibly involving the collaborative efforts of TNCH and the Waipa Foundation (see Section 2.e.(3) above).

The owner of the land in the Waipahe'e Stream unit indicates that he may reclaim the Kaneha Reservoirs by removing the silt that has built up in the reservoirs. These reservoirs are not included in the proposed critical habitat units, but they are fed by the Kealia Ditch which diverts water from the Waipahe'e Stream in the proposed critical habitat unit. The landowner indicates that he will only divert a quantity of water for which he has permits, and will not apply for permits for additional diversions.

In critical habitat areas owned by the State, there are no current plans for new diversions, and future water diversions are unlikely. There are also no plans to rehabilitate the complex of water-diversion structures and tunnels in the Hanalei River proposed critical habitat unit. A landslide has blocked the main tunnel that historically brought water to the Wailua River watershed. Staff at the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) on Kaua'i indicate that the cost is too high to repair this damage and no demand exists for Hanalei River water outside the Hanalei watershed. Thus, it is unlikely that existing diversions on the Hanalei River will be repaired.

#### **2.f.(4) Impact on the Construction of New Water Improvements**

Potential Activity, next 10 Years: Construction of new water improvements—none anticipated

Anticipated Costs of Consultations and Project Modifications: None

No consultations or project modifications are anticipated because there are no plans for new water systems that will impact the proposed critical habitat units.

#### **2.g. Hydropower**

##### **2.g.(1) Hydropower on Kaua'i**

Kaua'i's abundance of relatively large fast-flowing rivers has made it attractive to proponents of hydropower development. Seven hydropower plants, ranging in size from 0.5 megawatt (MW) to 3.8 MW, operate on Kaua'i; all were built before 1930 by various private landowners. The largest is A&B's hydropower plant on the Wainiha River, which is fed by water from a diversion at the 700-foot elevation located nearly a mile downstream from a proposed Snail critical habitat. None of these plants is located in or upstream of the proposed critical habitat for the Snail.

Several additional hydropower developments were proposed in the 1980s. During this time, the Service conducted eleven informal consultations on hydroelectric development projects: four on the Lumaha'i River, five on the Hanalei River, and two on the upper Wailua River. Applicants and Action agencies included the State, private entities,

the Federal Energy Regulatory Commission (FERC), and the U.S. Army Corps of Engineers. None of these projects was completed due to public opposition, environmental concerns, and difficulties in obtaining permits. In May 2001, a company that specializes in hydroelectric power plants filed an application with FERC for a 3-year preliminary permit to explore the possibility of building a dam on the lower Wailua River several miles downstream from the proposed Snail critical habitat.

While there was significant interest in hydropower development in the 1980s, it is highly unlikely that additional hydropower plants will be built in the next 10 years in areas that could impact the proposed Snail critical habitat. The 1995 Renewable Energy Resource Assessment Plan prepared for the State Department of Business, Economic Development and Tourism (DBEDT) states that due to existing protections and the history of hydropower development on Kaua'i, only the lower Wailua River is likely to have hydropower development. However, development at this location would not impact the proposed Snail critical habitat, and it may not occur due to conflicts with recreational activities on the Wailua River (RLA Consulting) and because of a variety of environmental concerns. Thus, DBEDT does not project that hydropower development will be a significant aspect of Kaua'i's future renewable energy generation.

The DBEDT projection is reflected in the current lack of plans for hydropower development by the landowners and managers of the Wainiha, Lumaha'i and Hanalei Valleys. While one and possibly both of the private landowners of the Wainiha and Lumaha'i Valleys want to maintain the option of building additional hydropower plants in the future, neither of them has specific plans to pursue hydropower. The State owns the upper Hanalei River which is in the Halelea Forest Reserve. Due to existing environmental protections and concerns, it is unlikely that the State will divert the natural flow of the Hanalei River to support hydropower development.

It is unlikely that landowners and managers on Kaua'i will develop plans for additional hydropower development in the next 10 years because additional capacity will not be needed. Kaua'i Electric recently received approval to build a 26.4-MW steam-injected combustion turbine power plant in 2002. This plant is designed to meet the projected demands for electrical power on the island for the next 10 years or more.

## **2.g.(2) Impact on Future Hydropower Development**

Potential Activity, next 10 Years: Hydropower development—none anticipated

Anticipated Costs of Consultations and Project Modifications: None

No economic impact on hydropower development because there are no plans for new facilities that will impact the proposed critical habitat units.

## **2.h. Ecotourism**

### **2.h.(1) Commercial Hiking Tours**

Commercial hiking tours, led by professional naturalist guides and featuring Hawai'i's unique ecosystems and endemic plants, are offered in a variety of locations on Kaua'i, particularly the Na Pali Coast region and other areas in the interior of the island. Three of the proposed Na Pali Coast critical habitat units are accessible by hiking trails, as are the Makaleha Stream Unit and the North Fork Wailua River Unit.

### **2.h.(2) Impacts on Ecotourism**

Potential Activity, next 10 Years: Commercial hiking tours

Federal Involvement: None

Anticipated Costs of Consultations and Project Modifications: None

No consultations or project modifications are anticipated because the activity does not have *Federal involvement*.

## **2.i. Natural Disasters**

### **2.i.(1) Hurricanes**

The most likely natural disaster to affect proposed critical habitat—and the one that would cause the most damage—would be a major hurricane passing over Kaua'i. In the past 50 years, Kaua'i has been hit or nearly hit by three hurricanes. In the mountainous regions proposed for critical habitat, wind and water damage caused by a major hurricane would include downed trees and branches as well as washed out roads, trails, and irrigation ditch systems. Recovering from a natural disaster would involve clearing away downed trees, branches, and other debris, and rebuilding damaged structures.

### **2.i.(2) Impact on Recovery from Natural Disasters**

Potential Activity, next 10 Years: Possible recovery from a natural disaster

Federal Involvement: Financial assistance from the Federal Emergency Management Agency (FEMA)

Consultation and Costs:

In the event of a natural disaster, a consultation with the Service would be required if financial assistance is sought from FEMA to help residents, businesses or government

recover from the occasional natural disaster in areas where there are listed species and/or critical habitat. In such emergencies, the Service expedites consultations.

- Total Section 7 Costs: \$1,500

Because of the presence of listed plants and wildlife in the mountainous interior and natural areas of the island of Kaua'i, it is likely the Service will conduct a section 7 consultation on any FEMA-funded projects in those areas. The designation of critical habitat may cause the Service to increase the scope of the section 7 consultation to assess impacts on the Snail. This analysis assumes that the increase in scope will involve a Service biologist familiar with the Snail to review the proposed projects. The cost estimate is based on 2 days of time at approximately \$750 per day.

- Cost Attributable to Critical Habitat: \$1,500

As noted above, the increase in the scope of these consultations will be due specifically to the critical habitat designation for the Snail.

Anticipated Project Modifications and Costs: Minor

As long as hurricane recovery projects are planned so that they avoid further damage to forests and streams—which is likely to be the case—the proposed Snail critical habitat designation would have little or no economic impact on FEMA projects following a hurricane.

### **3. INDIRECT COSTS**

#### **3.a. Land and Stream Management**

Some landowners and managers are concerned that the Snail critical habitat designation will directly or indirectly impose new obligations on them with regard to how they must manage their land, even if they do not propose a new project, land use, or activity. However, the Act does not obligate landowners to manage their land to protect critical habitat.

Nor would landowners and managers be obligated under the Act to participate in projects to recover a species for which critical habitat has been established. To aid in recovery of the Snail, it may be reintroduced into proposed critical habitat units, and potential threats (such as other predatory snails and introduced species) may be studied to determine their impact on Snail populations. If a threat is determined, the predatory and introduced species may need to be controlled. A preliminary draft recovery plan for the Snail provides a 5-year cost estimate of \$450,000 to conduct studies and manage all potential threats to the Snail. However, these reintroduction and threat-management efforts are likely to be sponsored by the Service as part of a recovery plan.

If a recovery project is developed for the Snail in Wainiha Valley, the owner of the valley and the hydropower plant would have to have agreements with the Service and the State to allow an incidental *take* of a threatened species (Chapter III, Section 3.a. and Chapter IV, Section 3.a.). A *take* could occur in the unlikely event that Snails would float downstream and enter the intake of the power plant. However, prohibitions on *take* are not found in section 7 of the Act, but rather in section 9; critical habitat designation under section 7 would not affect the likelihood of such a *take* occurring.

### **3.b. Property Values**

An issue that is commonly raised by private landowners is that their property may lose value because all of it or portions of it are in a designated critical habitat. They fear that the critical habitat designation will restrict potential uses of their land or increase their costs, thereby making the property less desirable and reducing its market value. The concern primarily involves land that is (1) located in the State Urban, Rural or Agricultural Districts, and (2) suitable for eventual development or commercial use based on access, gentle slopes, proximity to infrastructure and services, etc.

However, no such private properties exist within the proposed critical habitat. All of the private lands are in mountainous areas that have difficult access and terrain, and are in the State Conservation District where land-use controls severely limit development and most other land uses. Thus, the proposed critical habitat designation would result in little or no loss of potential development or any other economic use that could affect private property values.

### **3.c. Landowners' Uncertainty over Implications of Critical Habitat**

#### **3.c.(1) Services to Investigate Implications of Critical Habitat**

Some private landowners may choose to hire attorneys or use their own professional staff to investigate and summarize the implications of having all of their property or portions of it located in critical habitat. They may want to learn how the habitat designation may affect (1) use of their land (either through restrictions or new obligations), and (2) the value of their land.

For the Snail, three private landowners have property in proposed critical habitat units. While two of them own extensive acreage in Hawai'i and are familiar with the Act, this analysis assumes that all three will investigate the impacts of the proposed critical habitat on their properties.

### **3.c.(2) Costs to Investigate Implications of Critical Habitat**

Total Section 7 Costs: \$13,500

As noted above, this analysis assumes that all three of the private landowners will investigate the implications of critical habitat. The cost is based on an estimated 20 hours of effort at \$200 per hour. Assuming the attorney or landowner contact the Service during the investigation, the cost of the Service's time is based on 5 hours of effort at \$100 per hour.

Cost Attributable to Critical Habitat: \$13,500

Since this cost is incurred by landowners to reduce uncertainty about the impacts of the designation, it is attributable solely to critical habitat.

## **4. COST TO SMALL ENTITIES**

Under the Regulatory Flexibility Act (RFA) (as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever a Federal agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities.

SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

Based upon the preceding material in this chapter, affected entities could include the Federal government, the State of Hawai'i, the County of Hawai'i, The Nature Conservancy, and three private landowners. None of them qualifies as a small entity by U.S. Small Business Administration standards. Thus the proposed critical habitat designation will not have a significant economic impact on a substantial number of small entities.

## **5. BENEFITS**

### **5.a. Ecotourism**

As mentioned, in Section 2, commercial hiking tours, led by professional naturalist guides and featuring Hawai'i's unique ecosystems and endemic plants, are offered in the Na Pali Coast region and elsewhere on Kaua'i. Since the three proposed Na Pali Coast

critical habitat units and other units are accessible by hiking trails, critical habitat designation could benefit these ecotourism operations by providing a marketing dimension that enhances their appeal to visitors. However, this benefit is expected to be slight inasmuch as the area is already regarded as being special—as indicated by the Na Pali Coast State Park and the Hono o Na Pali Natural Area Reserve. In addition, viewing this small (1/4-inch-long) snail may appeal to only a few tourists, particularly since most of the sites known to be inhabited by the Snail require the viewer to put his or her face into the water to see them.

## **5.b. Species Preservation**

### **5.b.(1) Potential Benefits of Species Preservation**

The primary purpose of critical habitat designations is to protect areas that are needed to preserve threatened and endangered species. Critical habitat designations can also help educate unaware landowners or land managers about the importance of protecting the habitat of the listed species on their land.

If these endeavors are successful, environmental benefits anticipated by Service staff and other biologists include the survival and recovery of the Snail, greater biodiversity and healthier ecosystems, and enhanced opportunities for scientific experts to study the Snail. In addition, many people derive satisfaction simply from knowing that endangered and threatened species are being saved and that the species will be on earth for future generations to appreciate—even if they may never personally view them.

Finally, if the proposed critical habitat designations culminate in the successful recovery of the Snail, then related benefits would be: (1) reduced internal costs to the Service and to the other Federal agencies that are involved in consultations on listed species; (2) reduced internal costs for the non-Federal Applicant, if any; and (3) reduced costs for biological surveys (for cost estimates, see Section 2.b above). For the Snail, any reduction in these costs is likely to be modest given the outlook for few consultations.

### **5.b.(2) Research on the Value of Species Preservation**

No known studies have focused on the value of preserving endangered snails and, given the scope of this analysis, no primary economic research was conducted on the value of species preservation. Instead, most research on the value of species preservation has focused on mammals (e.g., the grizzly bear, gray wolf, humpback and gray whales, sea turtle, sea otter, bighorn sheep, etc.), birds (e.g., bald eagle, spotted owl, whooping crane, red-cockaded woodpecker, etc.), and fish (e.g., Pacific and Atlantic salmon, steelhead, cutthroat trout, squawfish, striped shiner, etc.). Depending upon the species, studies indicate that households are willing to pay an average amount ranging from \$6 per

year for the striped shiner to \$70 per year for the spotted owl, or they are willing to pay lump-sum amounts of \$15 for the cutthroat trout to \$216 for the bald eagle (Loomis and White). Household willingness-to-pay for a single species of threatened snail is likely to be lower than these amounts, particularly if the species is not well known to the general public.

### **5.b.(3) Value of Preserving the Snail**

A monetary value is not estimated for the incremental benefits related to preserving the Snail because of (1) the difficulty of quantifying the net changes in these benefits attributable to the Snail species listing or its critical habitat designation, and (2) the lack of relevant economic studies on the value of these changes.

## **6. SUMMARY OF ECONOMIC IMPACTS**

For economic activities affected by the proposed Snail critical habitat over the next 10 years, Table VI-2 summarizes the total section 7-related costs and benefits that are attributable to the Snail listing, as well as those which are attributable solely to its critical habitat designation.

The findings of minor economic impact reflect the fact that, with few exceptions, no new developments, commercial projects, land uses, or activities are anticipated in the nine proposed critical habitat units. This is because (1) the land is largely unsuitable for development and for most other activities due to the rugged mountain terrain, lack of access, and remote location; and (2) existing land-use controls severely limit development and most other activities in the mountainous interior of Kaula'i.

Also, certain projects and activities in the proposed critical habitat would not be subject to section 7 consultation because there is no *Federal involvement*, or activities involve O&M of existing human-made features and structures, or the projects or activities would not impact the *primary constituent elements* essential to the survival and recovery of the Snail. And for some projects, the incremental economic impacts over and above the economic impacts that would have occurred under existing Federal and State protections would be small or negligible.

Thus, as shown in Table VI-2, the only section 7-related costs attributable to the Snail listing and the proposed Snail critical habitat arise from (1) a few consultations on game-management, conservation, and natural-disaster recovery projects that are likely to receive Federal funding; and (2) potential costs to private companies to investigate the implications of having their lands designated as Snail critical habitat. Over a 10-year time period, the total section 7-related costs associated with the Snail are estimated at

\$33,700, while those attributable solely to the critical habitat designation are \$24,700. These costs represent a negligible percentage of the total personal income in Kaua'i County in 1999, which was \$1.3 billion.

Economic benefits resulting from the critical habitat designation could include the benefits of preserving the Snail. The value of these benefits is not estimated due to (1) the difficulty of quantifying the net changes in the benefits that would be attributable to the critical habitat designation, and (2) the lack of existing economic studies on the economic value of these changes.

**Table VI-2. Section 7 Costs and Benefits Attributable  
to the Newcomb's Snail Listing and Critical Habitat  
(10-year estimates)**

CH = critical habitat      C&PM = consultation & project modification      Fed = Federal      ne = not estimated

| <b>Item</b>   | <b>Total</b>     | <b>Share to CH</b> | <b>Explanation</b>   |
|---|------------------|--------------------|--|
| <b>DIRECT COSTS (cost of C&amp;PM)</b>                          |                  |                    |  |
| <b>Management of Game Hunting</b>                               |                  |                    |  |
| State-managed land  | \$ 3,000         | \$ 3,000           | Consultation already required due to Fed funding and the presence of listed plants. Small additional effort to address impacts on the Snail CH.                              |
| Private lands   | None             | None               | No consultation required since no Fed involvement.   |
| <b>State Parks</b>  | None             | None               | No consultation required since no Fed involvement.   |
| <b>Conservation Projects</b>                                    |                  |                    |  |
| Partners for Fish & Wildlife (PFW) Projects                     | \$ 3,800         | \$ -               | If private landowner agrees to PFW projects, then the Service will conduct informal internal consultations on funded projects.   |
| The Nature Conservancy of Hawai'i and Waipa Foundation Projects | \$ 10,400        | \$ 5,200           | If agreements are reached for these organizations to manage land, and they receive funding from the Service, then the Service will conduct consultations on funded projects. |
| Watershed Partnership Projects                                  | \$ 1,500         | \$ 1,500           | If a watershed partnership is formed and it receives funding from the Service, then small additional effort to address impacts on the Snail CH.                              |
| <b>Water Systems</b>  |                  |                    |  |
| Operations & Maintenance (O&M)                                  | None             | None               | No consultation for O&M of existing human-made features and structures. Also, no Fed involvement.  |
| New Stream Diversions and Irrigation Ditches                    | None             | None               | No plans for new stream diversions or irrigation ditches that would impact CH.   |
| <b>Hydropower</b>   | None             | None               | No existing or planned facilities that would impact CH.  |
| <b>Ecotourism Operations</b>                                    | None             | None               | No consultation required since no Fed involvement.   |
| <b>Natural Disaster Recovery Projects</b>                       | \$ 1,500         | \$ 1,500           | Fed involvement, but small additional effort to address impacts on Snail CH.   |
| <b>INDIRECT COSTS</b>   |                  |                    |  |
| <b>Land Management</b>  | None             | None               | No obligation to proactively manage lands to control threats.  |
| <b>Loss in Property Values</b>                                  | Small            | Small              | Little or no loss in land values because little or no loss of potential economic use.  |
| <b>Investigate Implications of CH</b>                           | \$ 13,500        | \$ 13,500          | One private company may investigate the implications of CH on its land.  |
| <b>BENEFITS</b>   |                  |                    |  |
| <b>Increase in Ecotourism</b>                                   | Small            | Small              | Few additional visitors to Kaua'i to view small underwater snails in remote locations.   |
| <b>Benefits of Preserving the Snail</b>                         | ne               | ne                 | Difficult to estimate preservation benefits and their value.   |
| <b>TOTAL</b>  |                  |                    |  |
| <b>Costs</b>  | <b>\$ 33,700</b> | <b>\$ 24,700</b>   |  |
| <b>Benefits</b>   | <b>ne</b>        | <b>ne</b>          |  |

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